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ABSTRACT

This monograph, containing 24 articles by 11 authors, describes a number of practices that have shown promise for better connecting high school with the broader world beyond school. The monograph begins with "Connecting High School with the Real World" (Sandi Harwell, William Blank), which discusses the concept of "real life" and various ways of defining the concept. "The Real World..." (Janet Scaglione) explores the notion of using important adult social roles, especially that of worker, as a window into adult life. This section also provides a brief look at the kinds of academic skills and knowledge actually used in most workplaces, examines how graduates will learn as adults, and closes with a snapshot of some of the most recent ideas in learning theory and intelligence. Each of 22 subsequent sections describes a promising practice for linking high school with the real world: "Authentic Instruction" (Blank); "Project-Based Learning" (Harwell); "Problem-Based Learning" (Teri D'Agostino); "Service Learning" (Blank); "School-Based Enterprises" (Blank); "Apprenticeships" (D'Agostino); "Internships" (Harwell); "Career Education: A Key Component of Career Guidance"(Harwell); "Teaching All Aspects of Industry" (Rich Westberry); "Integrating Academic and Vocational Education" (Westberry); "Cooperative Learning" (Scaglione, Blank); "Heterogeneous Grouping" (Harwell); "Mentoring" (Harwell); "Correspondence Study" (Stephanie VanDeventer); "Technology-Based Learning Resources" (VanDeventer); "Student as Teacher" (VanDeventer); "Career Academies" (Craig Winger, Alan Barber); "Alternative Schools" (Westberry); "Authentic Assessment" (Cindy Hewitt-Gervais); "Learning Communities: A Positive Climate for Learning" (Howard Johnston); and "Continuous Quality Improvement" (John Marshall). The final section, "High School Could Look Like This" (Blank), describes a high school that incorporates many of the most promising "real world" practices. (KC)

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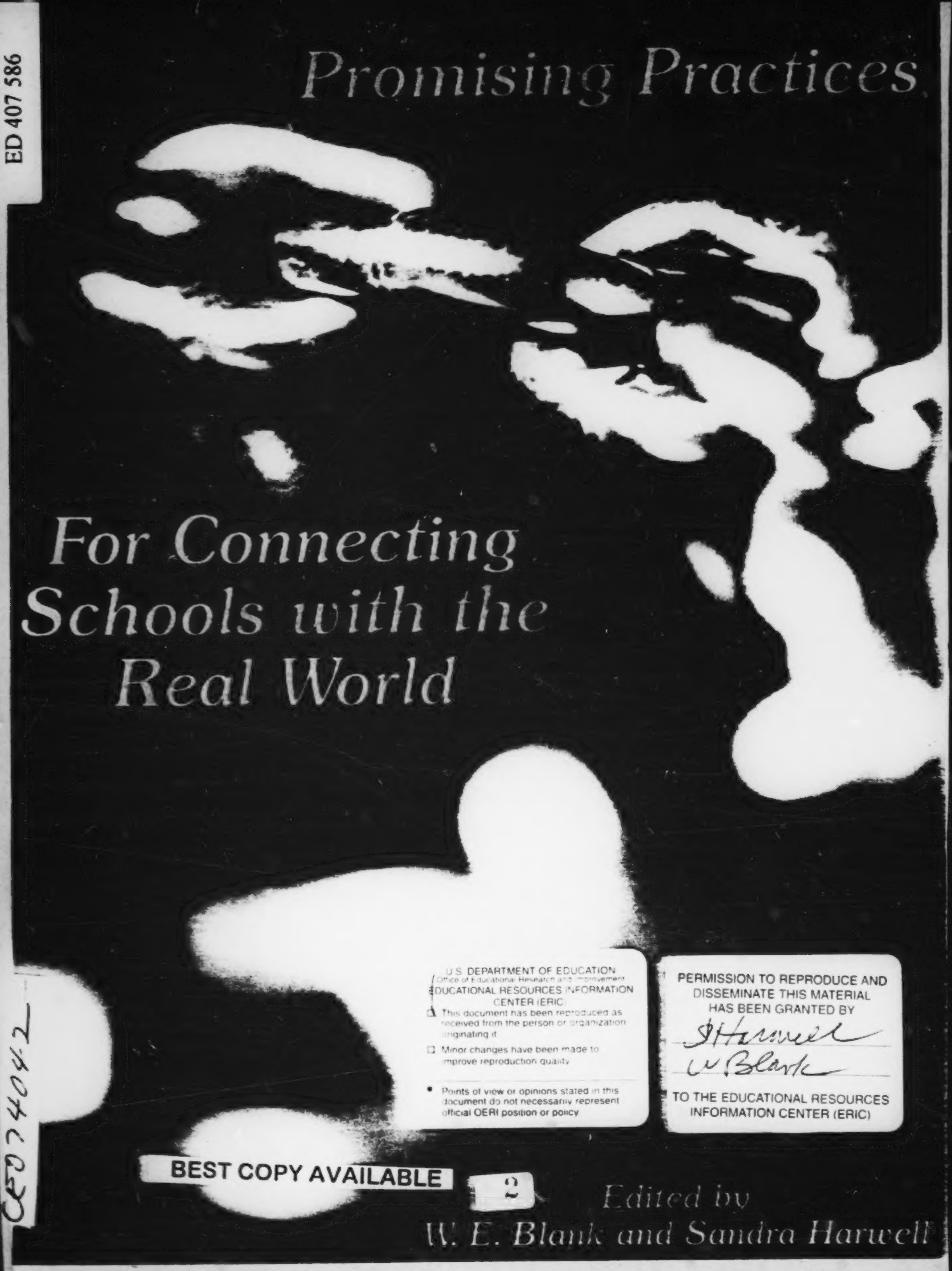
Promising Practices



For Connecting Schools with the Real World

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Promising Practices for Connecting High School to the Real World

University of South Florida
Tampa, Florida

USF

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Connecting High School With the Real World

Sandi Harwell and William Blank

This monograph describes a number of practices that have shown promise for better connecting what happens in high school with what happens in the broader world beyond school--the "real world". Few who have been in a high school recently would argue that much of what we ask students to learn is not very well connected with the knowledge and skills graduates of tomorrow will actually need to thrive in the world of adulthood. A keen observer would also notice that the most common teaching methods used in high schools today are the same methods that have been used in countless high schools throughout the past 50 years--hardly the learning strategies graduates will find themselves using as adults to keep abreast of changes in the high-tech workplace and in their adult lives. Finally, a visitor to most any high school today would surely notice that paper and pencil testing focusing primarily on the short term recall of facts from textbooks still predominates.

In short, the high school of today has changed very little from the high schools attended by our parents and even our grandparents. They are still organized around isolated academic disciplines, they still use a "listen to the lecture, read the chapter, answer the questions, take the test and then forget it all" approach to instruction. And testing--much of it trivialized--has taken on a more and more dominant role. It is very difficult to justify the continuation of such a high school model as we move into the next millennium. A time in which our graduates will face increasing global competition in the rapidly changing workplace, a time when they will change careers many times, will be faced with the most critical social and environmental decisions in human history, and a time in which they will live in a technological world we can only imagine. Completing four-years of barely connected courses whose roots are in the Middle Ages, most of which focus on the mastery of content from textbooks written a decade ago and at only a superficial level will ill-prepare our youth to take charge of their future. The world our graduates will inhabit for the next 50 or 60 years will not be organized around 50 minutes of English and 50 minutes of mathematics and 50 minutes of business education, each followed by a final exam.

There is a pressing need to better connect our high school curriculum and structure with the realities of life beyond high school. If one of the primary purposes of high school is to successfully prepare our young people for the world of adulthood, then the high school experience, it would seem, should resemble the world of adulthood. What we ask students to learn, how we ask them to learn it and how they are tested, this thinking goes, should closely mirror what they will need to become successful in their life roles, should mirror the learning strategies they will use as lifelong learners and should resemble the ways in which they will demonstrate proficiency on the job, in their families and in the community.

The historically dominant purpose of the American high school--do good on tests and get admitted to a university--serves only a small fraction of students, and many of them not very well when we consider that up to 50% of college freshmen often receive remediation in the basic skills. Since only about 15% of students beginning the ninth grade will eventually earn a four-year college degree, the mission and purpose of high school must be broadened significantly to include all students. Connecting the high school curriculum to the realities of the world beyond high school for all students must take into consideration where students end up after graduation. The little known truth is that very few of them actually graduate from a university. The largest majority of them enter technical training, complete a year or two of career focused education at a community college or go directly into the workplace (or at least try to enter the workplace).

High school should position every graduate to successfully begin the next major steps in his or her life--whether going to a university, entering a certificate or an A.S. Degree program or beginning a career with a future. A high school education, we believe, should also contribute toward competence in students' various roles as adults. In short, a student completing 14,000 hours of education culminating in a high school diploma should not face the shock, powerlessness, and frustration upon entering the real world that many of today's high school graduates (and dropouts) do.

Based on that vision of the high school, the University of South Florida in Tampa, Florida submitted a grant proposal to the USDOE and was funded in October 1995 to create "Project Connect". This project has two major goals:

1. Design and implement in several high schools a fully integrated "Real World" high school model which incorporates a "Life Based" curriculum in which student outcomes, learning experiences, and assessment strategies are derived from and strongly connected to students' immediate and future lives.

2. Design and implement a replicable, university-based teacher education program designed to prepare future academic and vocational teachers to fully integrate the high school curriculum using a real-world high school model and life-based curriculum.

One of the deliverables called for in the project is a monograph describing promising practices for connecting high school with the real world. This monograph begins by discussing the concept of "real life" and various ways we might define the concept. This first section explores the notion of using important adult social roles such as parent, spouse, citizen and son/daughter as a window into adult life. It calls special attention to the role of worker since adults devote more waking hours to that role than any of the others and since success in that role significantly influences so many other aspects of life including standard of living, social contacts, and health and well being. This section also provides a brief look at the kinds of academic skills and knowledge actually used in most workplaces, examines how our graduates will learn as adults and closes with a snapshot of some of the most recent ideas in learning theory and intelligence.

Each of the subsequent sections in the monograph describes a promising practice that has been shown to be effective in more closely linking high school with the real world. Some of these practices, such as cooperative learning, are not new. They have been included because of their great promise for mirroring how things are done in the world beyond school. Other practices, such as operating school-based enterprises for profit, have emerged more recently, but they also have much promise for linking the school experience with immediate and future life experience for today's high school students. Readers may wonder why some practices have been included while others have been omitted. Using applied academics, for example, has not been included because this approach – while a powerful approach to learning – does not necessarily connect the school experience with the world beyond school.

It is not expected that any one school or school system will adopt all or even most of these practices. It is hoped that readers will, first and foremost, be challenged by these examples of promising practices and realize how disconnected the current high school curriculum and structure really are from the realities of the real world and become committed to changing. A second purpose of the monograph is to provide some suggestions and ideas about specific practices that educators might want to use to begin the process of connecting high school with the real world. Although they can be helpful in operating schools more like organizations in the real world, we focused less on structural changes such as block scheduling, site-based management and the like and focused more on what happens in the classroom (or what too frequently, doesn't happen in the classroom). After all, that is where "the rubber hits the road". It is what happens during the instructional day in the classrooms of this nation's schools (in addition to what happens in our homes) that will largely determine the future of our graduates and the future of this country.

The Editors

March, 1997

The Real World . . .

Janet Scaglione

Connect school with the real world--it sounds simple doesn't it? In fact, it's almost too obvious. Most would intuitively support a mission and philosophy of schools that better connects with and reflects the real world. But what is the real world? How might one identify the knowledge, skills and attitudes required for success in the real world? One way to think of the real world is to examine the major components of adult life in the real world--after all, graduates from our schools will spend the next 50, 60, or more years in that world of adulthood. This examination will focus on three important aspects of adult life beyond school: adult social roles, the role of worker, and lifelong learner role.

Adult Social Roles

If the schooling process is to prepare students for their roles as competent adults, then one might ask "In what roles do competent adults spend their time?" Thirteen discreet social roles that have been identified by researchers include:

1) friend
2) spouse
3) citizen
4) son/daughter
5) relative
6) parent
7) learner
8) club member
9) worker
10) grandparent
11) home services manager
12) user of leisure time
13) religious affiliate

Typically, adults perform various and multiple tasks while going about the business of fulfilling these diverse roles.

Consider the obvious responsibilities of adulthood and the typical activities and projects that adults engage in. They solve real-world problems like clearing up a misunderstanding on a utility bill, shopping for and preparing nutritious meals, planning vacations, selecting a pediatrician, interpreting a lease or contract, and negotiating for a new car loan (or these days, a used car loan). To accomplish these real life tasks they are actively engaged in scheduling, contacting, communicating, comparing, researching, assessing, delegating, evaluating, presenting, arguing, and negotiating. Adults plan, deliver, solicit, and persuade. For many, these projects and challenges are part of caring for children, managing a home, interacting with relatives, and maintaining a 40-hour work week.

Interesting enough, adults seldom get fifty minutes to concentrate on one task, one role, or one project; and adults never separate language arts from computation, or knowledge of society from psychology. The knowledge, skills and attitudes used in adulthood are integrated into responsibilities that are ever present and constantly changing. Therein is a powerful message for teachers, curriculum writers and instructional designers. If schools are to prepare students to function in the real world, then students need to engage in activities in the learning environment that mirrors the realities of life!

The most time intensive role, by far, for most adults is that of worker. Since the workplace is where adults spend most of their waking hours, an examination of the work role also contributes to an understanding of the demands of the real world.

The Role Of Work

Today's workers must survive in the midst of global competition, threats of downsizing, increased demands on productivity, evolving technology, and growing diversity in the workforce. The dynamics of today's workplace and the speed with which things change mirror nothing we have witnessed before. Today's workers--accountants, technicians, health care professionals, food service workers, electrical engineers, environmentalists, and administrators must juggle work responsibilities, respond positively to change, implement quality standards and practices, and interact professionally with co-workers, superiors and especially the customers they serve.

The nature of work.

The very nature of work in today's economy implies a very different preparation and skill level than was required by our predecessors. According to the Bureau of Labor, in 1950, jobs in the US might have been classified as 20% professional (requiring a traditional baccalaureate degree), 60% unskilled (requiring no formal training), and 20% skilled (requiring technical or skills training.) Estimates for the year 2000 project that these percentages will change dramatically: about 20% professional, 65% skilled and 15% unskilled. While the percentage of professional jobs in our society has remained about the same, there has been a major reversal of skilled and unskilled jobs. Many suggest that this rapid transition to high skilled jobs stem primarily from the dramatic evolution of technology. All levels of workers, from the production line to the boardroom, are engaged in using technology to complete tasks, communicate, and solve problems. Most workers require increased skill levels and technical training which increases the demands on secondary schools.

Most workers today and in the future will require post-secondary education and training--but the data clearly indicate that the great majority of workers will not require a four-year college degree. This reflects the level of education of adults in the United States. Currently, only about 20% of adults in the US possess a four-year or higher degree. There is an important message here for educators and policy-makers. If the great majority of high school graduates will not achieve a four-year college degree and if the lion's share of jobs in our economy will require only a year or two of technical training beyond high school, should preparation for admission to a four-year university continue to be the most highly valued purpose of high school? Certainly not. One of the most fundamental ways to better connect our high schools to the real world is to dramatically change their mission and purpose to focus on the real life needs of the 80% who will not achieve a Bachelors degree while still serving the needs of those who will.

Academics used in the workplace.

Given the dramatic change in the nature of work that today's workers are engaged in, a review of the academic skills needed for that workplace provides another insight into how to better connect our curriculum to the future life and work needs of our students. Consider simply the three R's: reading, writing, and arithmetic. An investigation into the nature of reading and writing in the workplace reveals that today's professional and skilled workers read and write memos, proposals, technical reports, and letters. They read and write email, job descriptions, manuals, instructions, and paychecks and benefits documents. The reading and writing of the workplace looks distinctly different from the reading and writing we teach and test in our classrooms.

The mathematics of the large majority of workplaces includes basic math operations, measurement systems, probability, statistics, percentages, ratios, fractions, decimals, and graphical data. Seldom do most workers ever use the higher-level mathematics skills and concepts now being required in most schools. These include algebra, geometry, trigonometry and calculus. Various studies have identified the specific academic skills and concepts used in the workplace and have confirmed what a simple, informal inquiry might reveal. Workers primarily read and write to share information; and workers most often use basic mathematics rather than the complex functions of higher level mathematics. Perhaps policy makers and teachers should look to the academics actually used in most workplaces in order to select appropriate content and design more appropriate learning experiences for our nation's classrooms. If schools had a balanced curriculum that reflected both traditional content outcomes and "real-world" outcomes, perhaps the academic skills needed in the workplace would receive an equal representation in the curriculum. We're suggesting an appropriate balance between the traditional outcomes of schooling such as transmission of our culture with the practical skills graduates will desperately need to compete and thrive in their roles as adults – particularly that of worker.

Competencies and skills in the workplace.

Yet another way to consider the needs of today's workers is through the generic competencies and skills required for almost any career. Numerous reports and studies have identified what might be considered the generic or transferable skills that are required to function successfully in today's workplace. Perhaps the best known such report is the SCANS Report, which involved leaders from business and industry from across the United States. In 1991 the Secretary of Labor commissioned the Secretary's Commission on Achieving Necessary Skills. This influential report indicated that all workers must know how to manage resources, demonstrate interpersonal skills, use information to solve problems, collaborate with colleagues within dynamic systems, select and use technology and be personally responsible.

Other similar reports have reinforced that America's workers must know how to learn, communicate effectively, lead and manage others, think critically, and collaborate to solve problems. Most of these work related initiatives reference the increased requirements and skills needed for today's workplace. If one of the roles of schools is to prepare people to successfully enter and remain in the workplace, then these generic competencies and skills need to be reflected in the curriculum. Even a cursory examination of the content and methods that currently dominate our secondary classrooms finds little attention being devoted to this critical workplace know-how.

Lifelong Learner Role

That learning continues beyond school is obvious. In fact, one prerequisite for success today is an acceptance of the life-long nature of learning. But how do adults learn in the real world? When asked to reflect personally on this question, adults usually respond with comments like "I learned things the hard way." "Trial and error was my teacher." In other words, adults most often learn by doing.

Parents learn to interact with their children by hands-on experience. A child learns to ride a bike by getting back on it after a fall. Imagine if learning to parent were like learning American History or most any other subject in school--read the text, answer the questions, take the test, and go on to the next chapter. We'd take fifty minutes of the trauma of teething before moving on to dealing with diaper rash. The fact that a child can learn to speak, walk, and reach the cookie jar on the top shelf confirms that learning takes place when we are immersed in our environment--all without any formal instruction at all. Yet, many associate education and learning only with schools and classrooms--but most classrooms are far removed from the rich, contextual learning environments of life.

How the brain learns.

School, as it is reflected in most traditional classroom experiences, violates many of the conditions that are required for the brain to learn most efficiently and effectively. Recent findings in cognitive science reveal that the brain processes parts and wholes simultaneously, therefore, people have enormous difficulty learning when either the parts or wholes are overlooked or disconnected. The brain needs a context in order to associate the parts. Since the brain is constantly searching for connections, educators can assist that process by designing lifelike experiences for learners. When students clearly see the connections of the content to some larger setting or context, then learning is enhanced.

Real World Intelligence.

When Alfred Binet was commissioned by the Department of Education to construct a measure that would predict which children were at risk in schools, he developed the measure of "Intelligence". While the intelligence test is still used to sort and select students in our nation's school systems, there are some who question its validity as a predictor of success in the real world. Howard Gardner, a noted Harvard psychologist, suggests that intelligence may be more related to how we solve problems. Furthermore, he identifies seven ways of being smart, which include Linguistic, Logical/Mathematical, Spatial, Bodily Kinesthetic, Interpersonal, Musical, and Interpersonal. In the traditional environments associated with most school systems, two intelligence's receive the most reinforcement: Linguistic and Logical/Mathematical. Using Dr. Gardner's theory, schools might provide stimulation for all seven intelligence's through the use of an authentic, life-based curriculum. While linguistic and mathematical intelligence may be important, most would agree that society also values and needs the other five.

Considering the adult social roles, important workplace competencies, importance of lifelong learning, principles of brain-based learning, and a contemporary view of human intelligence provides a rather comprehensive view of the real world. If the world beyond school is ultimately the destination of all students, then perhaps schools should consciously provide preparation for those roles. The promising practices described in this monograph are intended to better connect school with that world and thereby better prepare students for their life and work roles.

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Authentic Instruction

William Blank

This monograph makes a case for better connecting what happens in school with what happens (and how it happens) in the world beyond school--the “real world”. Much of the disconnectedness of the current, school curriculum, methods and structure come from their fundamental lack of “authenticity”. Schooling has become badly disconnected from life itself; schooling has largely become a contrived experience. Students realize that much of what they are asked to learn will be of little use to them in their various roles as adults. They can sense that many of the teaching strategies used are far removed from the ways in which they see learning taking place in the real world around them. And the testing that students must endure does not very closely resemble how they will demonstrate performance as adults in the world beyond school. The current system of education cries out for more authenticity, that is, more resemblance to the realities of the world beyond the classroom.

What Is Authentic Instruction?

Broadly viewed, authentic instruction is any instructional strategy, model or technique that involves students in learning something that is useful or important beyond the school setting and that engages them in a manner that helps them construct new knowledge or develop deep understandings or insights. Authentic learning outcomes or tasks often resemble or may involve the same performances that adults are called upon to perform in the world beyond school. That world might be the workplace, the home, or the community. Authentic instruction is also referred to as authentic learning or authentic pedagogy. An example of an authentic learning task might be for a small group of students to develop and administer a survey to a sample of local residents regarding their fresh water usage and then present the results to the local water management board in writing using desktop publishing and orally using presentation software. In short, an in-school learning task closely resembling an authentic real world task that adults might actually carry out in the world beyond school.

Fred Newmann and Gary Wehlage of the Center on Organization and Restructuring of Schools suggest that there are five "standards" of authentic instruction. They suggest that truly authentic instructional strategies will have the following common characteristics:

- *Involve Higher Order Thinking (HOT)*: rather than focusing on teaching factual information, rules, and algorithms, authentic instruction involves HOT which requires students to manipulate information and ideas in new ways to synthesize, generalize, or hypothesize.

- *Depth of Knowledge*: rather than only a trivial or surface acquaintance with a topic, authentic instruction promotes deep understanding of significant concepts and central or crucial ideas of a topic or discipline. Depth comes from covering less "material" more critically.

- *Connectedness to the World Beyond the Classroom*: Material with little connectedness is useful only in school (now or later). Students' work has no impact on others. School work with authenticity involves extensive connections to the larger social context in which students live today and tomorrow.

- *Substantive Conversation*: In traditional teaching, teacher-student interaction typically consists of lecture, recitation, brief questions and even briefer answers. This might be viewed as the oral equivalent of a fill-in-the-blank test. With authentic instruction there is substantive interaction (usually non-planned) about fundamental, core elements of the material. The dialogue leads to higher order thinking such as making distinctions or generalizations.

- *Social Support for Student Achievement*: In a classroom with high social support, the teacher conveys high expectations for all students, encourages risk taking and establishes mutual respect. All students are included and those with less skill are treated in ways that encourage their full effort.

Grant Wiggins defines authentic tasks as those that are "engaging and worthy problems or questions of importance, in which students must use knowledge to fashion performances effectively and creatively and that resemble the 'real-life' tests of adult life." Newmann cautions us that there are many activities that we can engage students in that are realistic and challenging but that don't involve much learning. For example, wilderness survival, athletic feats, and selfless acts of caring are all "authentic" but all lack a crucial element: "disciplined inquiry". Since the purpose of school is learning, disciplined inquiry is an essential element of authentic learning.

Authentic learning might be viewed as a combination of authentic or real world performance (deriving it's authenticity) coupled with rigorous, disciplined investigation leading to deep understanding (resulting in rich, lasting learning). Authentic instruction has much in common with contructivism although these are not entirely synonymous terms. Both perspectives call for a move away from a transmission of knowledge to passive receivers to empowering learners to become constructors of their new knowledge.

What Is The Primary Rationale For Using Authentic Instruction?

The primary reason for adopting authentic instructional approaches is to get away from the contrived nature of traditional approaches to curriculum and instruction. Since students spent their early developmental years in the authentic world and will spend the rest of their lives there when they leave school, why not make the experiences during schooling more closely resemble experiences in that real world? After all, the brain evolved over millions of years becoming highly adapted to learning and developing in a rich, emotion filled, interactive and highly integrated environment. Sitting in a seat, working alone, memorizing isolated facts from disconnected disciplines for recall on a paper and pencil test does not capitalize very well on how the brain works best.

Newmann, Marks and Gamoran write, "Students can earn credits, good grades and high test scores...demonstrating a kind of mastery that frequently seems trivial, contrived or meaningless outside the school. The reformers call instead for "authentic" achievement, representing accomplishments that are significant, worthwhile and meaningful."

John O'Neil writes "Dewey's theories on learning by practical experience are buttressed by cognitive research showing that students learn better when they solve real-life problems, as opposed to being drilled on decontextualized bits of information. As a result, many schools are trying to reorganize curriculum and instruction to support 'authentic learning,' the new catchphrase for learning by doing."

Newmann suggests that there are four very important qualities of adult work in the real world that are all too often missing in schoolwork: value beyond instruction, clear feedback, collaboration and flexible use of time. For example, studying the habits of fish when one is also responsible for caring for them is more authentic than just learning about their behavior from a textbook (or CD ROM) for a test. Actually caring for fish is useful beyond school, provides immediate, direct feedback based on the health of the fish, can easily involve collaboration if a team approach is used and will take differing amounts of time as needed.

What Are Some Examples Of Authentic Instruction?

Examples of various approaches to authentic instruction include but are certainly not limited to the following:

- Completing a complex project resulting in a useful product.
- Setting up and operating a for-profit enterprise based in the school.
- Researching answers to meaningful questions generated by students.
- Generating solutions to critical problems facing the community.
- Rendering and then reflecting on a community service assignment.
- Critically examining major world events as they unfold.
- Paid or unpaid apprenticeships or internships.
- Independent study or directed research.

What Are The Benefits Of Authentic Instruction?

In addition to the proven academic gains associated with authentic instruction, other benefits include:

- Promotes higher order thinking and problem solving.
- Can be used as a vehicle to link the school with the community.
- Promotes student engagement and involvement.
- The array of authentic learning activities is limited only by the teacher's imagination.

- Reduces students' questioning the value of what they are being asked to learn.
- Promotes and is in harmony with authentic assessment.

What Does Research Say About Authentic Instruction?

The Center on Organization and Restructuring of Schools suggests that there is not yet conclusive proof that authentic instruction produces high quality achievement from all students in all subjects. They add, however, that the elements of authentic instruction represent a synthesis of ideas proposed by experienced educators and documented in various studies. There have been recent studies, however, that are beginning to document the positive impact of authentic approaches to instruction.

Valerie Lee reports "Studies show...that disadvantaged students can indeed learn complex tasks and information, and that exposure to richer, more authentic learning environments can lead to gains in achievement for all students." In a study of 820 high schools that had gone through various restructuring processes, Lee found that "...an average student in a school with high levels of authentic instruction would learn about 78 percent more mathematics between 8th grade and 10th grade than a comparable student in a school with low levels of authentic instruction." Gains in other disciplines were reported as well.

Newmann, et.al, examined eight high schools that had undergone major restructuring. Their goal was to determine the level of authenticity of instruction occurring in selected classrooms and determine if there was a link between degree of authenticity and student performance. First, they found that even in these restructured schools, some--but not much--authentic instruction was occurring. Second, they did find a positive link between the use of authentic teaching strategies and student performance. They reported "...they translate to substantial improvements in students' rankings compared to their peers. Regardless of race or gender, an average student would move from the 30th to the 60th percentile if he or she received high authentic pedagogy instead of low authentic pedagogy...This illustrates the major contribution that authentic pedagogy can make to students' academic performance."

What Do Educators And Students Say About Authentic Instruction?

About authentic instruction, Brian, a student at Horizon High School says, "...I can make connections a lot better...My other classes, they give me the work and I just do it, but this class you've got to think." John Cronin of the Loess Hills Area Educational Agency in Iowa states, "The power of the authentic learning movement has been in the simplicity of its central idea: students' experiences in school should more closely resemble the experiences they encounter in real life." He adds, "Let's be realistic. Not every learning activity must duplicate real-life experiences. The hope is that, over time, activities will more closely resemble the real world than they have in the past."

What Are Some Potential Problems With Using Authentic Instruction?

One problem with moving toward authentic instruction is the misconception that for learning to be authentic it must be reality itself. For example some might argue that for Spanish instruction to be 100% authentic, the student would need to live in a Spanish speaking community and learn from "real" Spanish speakers. It is, rather, a matter of degree ranging from somewhat authentic to fully authentic. Somewhat is better than not at all. For example, our Spanish student would still be better off learning real world Spanish conversation (even if it is in a classroom) rather than memorizing stock Spanish phrases from a textbook. Of course, living in a Spanish community for a time would be ideal but is hardly feasible for all students.

Another serious challenge of using authentic instruction is the difficulty in reconciling authentic learning tasks with the existing standards, textbook chapters, curriculum guidelines, etc. that teachers are forced to "cover". Teachers may also fear that too much time spent on authentic learning might hurt students when they take standardized tests. It usually takes time for teachers, parents, administrators and even students to realize that the academic skills and content are really being mastered along the way. While students engage in truly authentic pursuits, they learn how to compute, how to express themselves and how it all fits into our culture.

Where Can I Learn More About Authentic Instruction?

Newmann, Fred M., et al. Authentic Pedagogy and Student Performance. Center on Organization and Restructuring of Schools, Madison, WI, 1995 (ED 389 679)

Center on Organization and Restructuring of Schools. Crafting Authentic Instruction. Madison WI, 1993 (ED 378 694).

Project-Based Learning

Sandi Harwell

The history of project-based learning can be traced to John Dewey. It is not a new concept, but one that is being reintroduced. It is not surprising to discover that students learn better when content is connected to real-world concepts. It is not surprising to realize that as adults, individuals have no need to separate cognitive tasks into separate academic disciplines. In fact, adults in real-life integrate the cognitive skills to successfully solve problems. Integrating academic and vocational education is one way to connect the academic skills to life skills. W. Norton Grubb and his colleagues described the most commonly used methods for integrating academic and vocational education. Among these methods, the Senior Project was described as an ideal method of integration because it allowed individualization and the use of multiple disciplines and courses to accomplish a real-world task. Project-based learning is a way to help students realize the connection between academic content and accomplishment of complex real-world tasks and do so in a real-world way.

What Is Project-Based Learning?

In the context of this monograph, a project is defined as an assignment in which an individual or group of students creates some useful, authentic finished product or service. In completing the project, students define a problem, evaluate solutions, collect information; seek assistance from experts in the community, locate needed resources and work collaboratively. Projects can span a number of class periods, several weeks or even an entire semester. While not all projects are "authentic", such projects add a degree of realism that "contrived" projects lack. Project-based learning involves an individual teacher or teams of teachers from different disciplines working together to assist students in producing real-world products or projects. The projects can be community-based or school-based in nature. The teacher, using the identified project as the focus, works with groups of students to identify possible ways of completing the project, using skills and knowledge from the various disciplines in the process. The project is the focus of learning in a real-world sense and the academic and/or vocational content serves as a support structure for the successful completion of the project.

What Is The Rationale For Using Project-Based Learning?

With the demise of the Industrial Age, the need to have individuals learn by drill and practice in preparation for factory jobs which required repetitive tasks has been replaced by a need to empower front-line workers to make decisions based on an overall understanding of the organization. According to William Bridges, the job, as we know it, is a social artifact that is being replaced by a more entrepreneurial relationship between organizations and workers who will be assigned to projects. Organizations, according to Bridges, are changing from structures supported by jobs to "fields of work needing to be done." With a change in the nature of the type of work most of America's workers will be engaged in, we can safely say that the focus of schooling, based on the Taylorist factory model is no longer sufficient or needed. What students preparing for jobs in the next century need is an understanding of how to identify a problem and design a method for solving the problem. It is not sufficient to simply provide isolated content, which requires memorization of facts for students who will be facing issues of a more global nature. Seeing the "big picture" will be one of the most valuable skills for workers moving into a more project-driven workforce.

Additionally, cognitive skills taught in isolation without the connection to how and where they are used in the real-world, are difficult for individuals to retrieve from memory. Contextual learning is natural and facilitates making connections appropriately to solve problems. According to Caine and Caine, "...students learn from their entire ongoing experience". In many ways, content is inseparable from context. Helping students understand the interconnectedness of subject area content knowledge should be the goal of educators. Projects are an excellent vehicle for doing this.

Dale Parnell described the four a's of meaningful education as 1) learning for acquisition of knowledge; 2) learning for application; 3) learning for assimilation, and 4) learning for association. When students are engaged in project-based education, students not only acquire information, but they retain it so that they are able to transfer the learning to new problem-solving situations. Part of learning through projects is reflecting on how the knowledge could be used in new situations.

Project-based learning provides a vehicle whereby complex critical thinking skills must be utilized. In addition, students are involved in directing and evaluating the learning. The learning outcomes therefore reflect the kinds of life skills that are essential for success in the workplace and today's society. In short, perhaps the simplest rationale for project-based learning is that we learn best by doing. As John Holt suggested, it is folly to view learning and doing as separate, for they are inseparable. If we really want someone to learn something well, he cautioned, the individual must do it.

What Are Some Examples Of Project-Based Learning?

The Rivers Project in Illinois involves 8 schools and 24 teachers from science, social studies, and English disciplines. The students study the Mississippi River, the ecology and safety of the water, and the impact, economic and ecological, of the River on the communities that are along its path. The information gathered by the students as a result of testing, is shared through the project's telecommunication system, SOILED NET, with other schools and the United States Fish and Wildlife Service. A report to Congress on the condition of the Illinois rivers prepared by the Illinois Environmental Protection Agency used the data collected and compiled by the students involved in the Rivers Project. The students routinely prepare reports and presentations for important gatherings such as the Governor's Conference on the Illinois River, the Upper Mississippi River Basin Association, and the Illinois Rivers Project Student Congress. The students, through this project-based learning have impacted their communities and have learned how to successfully apply academic knowledge in an integrated, real-world way.

The Senior Project at Frostproof High School in Florida, is an example of how high school students can focus their high school experience toward acquiring the skills necessary to complete real projects later in life. The Senior Project can result in a synthesis of four years of learning. Frostproof Senior Projects may include a written report, an oral presentation, and a product of some sort developed in the vocational lab. Some Senior Projects culminate in a portfolio that is juried by a panel of experts in that particular area. Other schools have utilized Senior Projects to integrate academic content rather than incorporating a vocational component; other projects may involve both components. However the Senior Project is designed, the purpose is a synthesis and application of knowledge from multiple disciplines resulting in a completed product.

Thomas Haynes and Connie Schroeder described projects as a vehicle for promoting and demonstrating critical thinking. Examples of projects they felt were designed to accomplish this included a) setting up an accounting system for a business; b) developing a marketing plan for a product or service; c) developing a fertilizer application plan; d) developing a set of criteria for assisting the community to select the best buys for particular products; e) planning a repair or remodeling project; and f) using a task analysis to analyze a health occupations career and determine the skills, knowledge, attitudes, and training required to teach the training program.

The Illinois Mathematics and Science Academy, after an unsuccessful try at a thematic approach to integration for the purpose of encouraging transfer of science knowledge from the familiar school environment to a novel environment in the real-world, developed a project-based curriculum which presented the students with a real-world problem in a familiar environment outside the classroom. The students discovered essential content in the process of completing the project. Project-based learning is a tool for teaching students to solve complex real-world problems. Possible project ideas are limitless. Projects that have been tackled by students in elementary, middle and high schools include the following examples:

1. Analyze rooms and zones of buildings for air conditioning efficiency.
2. Design and construct playground equipment.
3. Produce a video yearbook.
4. Convert landscaping to xeriscaping.

What Are The Benefits Of Project-Based Learning?

The benefits of project-based learning include the student's use of higher order thinking skills, self-assessment, and discovery learning as well as preparation for life-long learning. The assessment of project-based learning is, by necessity, more authentic. Traditional multiple-choice, true/false exams cannot reflect the learning outcomes from the design and development of the project.

Other benefits include the student's demonstration of integrated academic and vocational content. These demonstrations can be in the form of public exhibitions. Through public exhibitions, the community can be involved in assessing the learning and in directing the projects. This builds community support for the local education system. Students learn the process of identifying a problem, planning to correct the problem, and implementing and evaluating the plan. In other words, students learn how to manage project-based work--essential preparation for a project-based world.

What Are Some Potential Problems Of Project-Based Learning?

Project-based learning requires intensive staff development for teachers who will be involved. Teachers are not traditionally prepared to integrate content and connect it to real world activities. Project-based learning requires a non-traditional assessment that is unfamiliar to most teachers. Working on large-scale projects requires considerable planning to assure that critical content in the subject areas will be covered. Common teacher planning time is hard to arrange. Because the learning is non-traditional, parents and community members must be included in the education plan. Preparing parents and community members to function as jurors of project exhibitions is time consuming and difficult to arrange. Reconciling the authenticity of project-based learning with the artificiality of the traditional grading systems, many teachers are still forced to use, can be a challenge.

How Can I Learn More About Project-Based Learning?

Bridges, W. (1994). The end of the job. Fortune. September. pp 62-73.

Caine, R. & Caine G. (1991). Making connections: Teaching and the human brain. Alexandria, VA: ASCD.

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Parnell, D. (1995). Why do I have to learn this? Waco, TX: CORD.

Sizer, T. & Rogers, B. (1993). Designing standards: Achieving the delicate balance. Educational Leadership, 50, (5). pp. 24 -26.

Tchudi, S. & Lafer, S. (1993). How dry is the desert? Nurturing interdisciplinary learning. Educational Leadership, 51, (1). pp.76-79.

Williams, R., Bidlack, C., & Winnett, D. (1993). At water's edge: Students study their river. Educational Leadership, 51, (1). pp 80-83.

Problem-Based Learning

Teri D'Agostino

Problem-based learning (PBL) is not new. It has been tested in medical schools and has seen much success. It is now making its way into the secondary classrooms. Problem-based learning connects the students to the "real world" by giving them a good look at problematic situations and how they are resolved.

What Is Problem-Based Learning (PBL)?

In a PBL classroom, students (often placed in groups) are given a situation to resolve. The problem is "real-world based" and is often from situations that have arisen in the community or in a career situation. The problem should be ill-structured so that the students experience the way problems present in real-life. The individual or group is then challenged to solve the problem. Students must use what they know to discover what they don't know. They then research the situation to create possible solutions. The students usually present their solutions in a written report, oral report, or both much as an employee might do for an employer. One major distinction between problem-based and project-based learning is that projects require not only the solving of problems but also carrying that solution to reality through the creation of a finished product.

What Is The Primary Rationale For Using Problem-Based Learning?

One of the main reasons to use PBL is to prepare students to tackle questions/problems/situations as they might occur in their future careers or adult lives. For example, a couple comes into your counseling practice with marital problems. You need to be able to ask the correct questions to get to the cause of the problem. Using PBL helps students develop the skills they need to thoroughly research a situation, weigh possible solutions, then select and defend one they think is most appropriate.

What Are Some Examples of Problem-Based Learning?

Joan Savoie and Andrew Hughes worked with a ninth grade Global Studies class in Canada. The class was studying tradition and change within the family and were presented a case study from the classroom edition of the *Wall Street Journal*. Students researched the situation, created questions that needed to be answered by the "couple needing counseling" and even got to talk to a psychologist who visited the class.

The Illinois Mathematics and Summer Academy spent a summer with 100 seventh and eighth grade students. Students were presented with the "thorium waste problem", researched possible solutions and presented their suggestions to government experts, scientists and community activists. Students had to deal with the very real controversy in generating possible solutions to disposing this nuclear waste.

What Are the Benefits of Problem-Based Learning?

While engaged in PBL, students are not sitting passively listening to lectures, but rather are actively searching for a solution to the posed problem. Below are some of the benefits of PBL, as mentioned by Savoie & Hughes and Stepien & Gallagher.

- Nurture collaboration among learners
- Increased motivation
- Learn time management
- Authentic learning
- Learn content and skills

What Does The Research Say About Problem-Based Learning?

Sobral reports that "PBL course was perceived as a personally more meaningful learning experience in comparison with previous courses taken." Students were enrolled in one of two courses, one taught in conventional style, the other using PBL. A Course Valuing Inventory (CVI), which relates meaningfulness to perceived learning and course valuing, was used as a measurement. One finding was that at the beginning of the study, "the PBL group had a significantly lower CVI total score...whereas the total score of the PBL group was significantly higher at the end of term."

Hmelo, et al., in a study conducted with medical schools, found "PBL instruction has distinct cognitive consequences that may influence medical practitioners throughout their careers." Also, "PBL students were more likely to use a combination of basic science and clinical texts whereas non-PBL students were more likely to use exclusively clinic texts.... In fact, none of the first year non-PBL students planned to use mixed resources."

What Do Educators And Students Say About Problem-Based Learning?

One student from Canada stated, "Everyone's learning together.... If someone doesn't understand, you're in a group. I mean they'll usually explain it to you more. No one's left out. Everyone gets the message and gets what you're doing." Another student made this remark about the teachers, "This way you get to know your students better. You get to make sure they know what they're doing. You know if they understand."

What Are Some Potential Problems With Using Problem-Based Learning?

While there are many benefits to using PBL in a classroom, concerns do exist. These include:

- Learners may assume they should discover the outcome the instructor wants
- Major restructuring of classroom procedures may be needed
- More training for instructors
- Testing and grading concerns

As with all the other practices described in this document, the successful use of problem-based learning requires teacher training. Teacher education programs may not adequately prepare new teachers to use PBL extensively in their classroom.

How Can I Learn More About Problem-Based Learning?

Hmelo, Cindy, Gerald Gotterer and John Bransford. The Cognitive Effects of Problem-Based Learning: A Preliminary Study. Paper presented at the Annual Meeting of the American Educational Research Association, April, 1994, New Orleans, LA.

Savoie, Joan and Andrew Hughes. Problem Based Learning as Classroom Solution. *Educational Leadership*, November, 1994, pgs. 54-57.

Sobral, D.T. The Problem-Based Learning Approach as an Enhancement Factor of Personal Meaningfulness of Learning. *Higher Education*, Volume 29, 1995, pgs. 93-101.

Stepien, William and Shelag Gallagher. Problem-Based Learning: As Authentic as it Gets. *Educational Leadership*, April, 1993, pgs. 25-28.

Service Learning

William Blank

An increasing number of students are being asked and sometimes required to render service to others as an integral part of their school experience. Service learning is seen as a way of making the curriculum more meaningful for students, helping those in the local community who need it and giving students an opportunity to enhance their self worth. The practice is not without controversy, however. Requiring community service as a graduation requirement, for example, has been challenged by parents and students in the courts.

What Is Service Learning?

"Service learning" is the process of learning through the experience of rendering service in the school or in the community and actively reflecting upon the experience. It is more than just volunteerism because the service activity becomes an integral part of the curriculum and often includes learning activities in preparation for the service and reflection after (or periodically during) the service activity is completed.

What Is The Primary Rationale For Using Service Learning?

When our way of life was agrarian, young people were indispensable to the family and community. They developed a sense of self worth as they helped with household chores, guided younger siblings, assisted grandparents, tended animals and helped with the harvest. Modern urban living, on the other hand, provides little opportunity for youth to have a meaningful role in family or community. Also, many adolescents find youth a period of emptiness and a search for meaning. Service learning addresses these problems by offering youth the opportunity to be responsible, caring, participating members of society.

What Are Some Examples Of Service Learning?

Service learning opportunities are abundant. They may be found within the school itself, in the immediate community surrounding the school site or in the larger community. Examples of service learning activities include:

- Civics students in Washington helping new immigrants pass their citizenship tests.
- Students in Massachusetts creating a health center to serve the needs of students.
- High school students in Nebraska lobbying their state legislature regarding a bill to lower the blood alcohol level for drunk driving.
- Students in Omaha presenting a detailed proposal to the President's office on how to reduce the budget deficit.
- Students involved in the KIDS (Kids Involved Doing Service) Consortium in Portland monitoring water and soil quality, documenting neighborhood history, conducting inventories of natural resources, developing nature trails and designing playgrounds.
- Students at Gig Harbor High School in Washington translating and illustrating children's stories for homeless Hispanic families, running a science lab at a nearby elementary school, serving as mentors for at-risk elementary school children, and keeping the books for the local food bank.

There are many variations for weaving service into the school curriculum but the most common approaches include (1) having a separate course devoted to service learning (required or elective), (2) service as a major assignment(s) within existing courses or (3) service as an extracurricular activity but required for graduation.

What Are The Benefits Of Service Learning?

One of the primary benefits of service learning is that its goals are consistent with the goals of any effective school curriculum: intellectual development, basic skill acquisition, moral and ethical development, social and civic responsibility, career preparation, multicultural understanding and personal growth. An important benefit of service learning, however, is that engaging students in service related activities provides a contextual, applied, relevant and challenging setting which enhances students' interest and engagement.

The use of service learning avoids two of the drawbacks of using apprenticeships to connect school to the world of work. To participate in most apprenticeships, students must be at least 16 years old which limits such experiences to the 11th and 12th grades for most students. Unfortunately, a large number of urban youth who could profit most from such experiences have dropped out by the 11th grade. Secondly, there are usually a limited number of apprenticeship placement sites in a given community. Using service learning experiences to not only render service, but to also learn broad job readiness skills greatly expands the possible placement sites. Service experiences, for example, can happen right in the school and in the many non-profit agencies in a community.

What Does Research Say About Service Learning?

Conrad and Hedin observe that little research has been conducted to document the results of service learning, but based on over 20 years of experience with service learning and after a review of research in the field they suggest that well designed service learning programs will have many positive effects on students, including:

Personal Growth and Development:

- Self-esteem
- Personal efficacy
- Ego and moral development
- Exploration of new roles, identities, and interests

- Willingness to take risks, accept new challenges
- Revised and reinforced values and beliefs
- Taking responsibility for, accepting consequences of own actions

Intellectual Development and Academic Learning:

- Basic academic skills
- Higher level thinking skills
- Content and skills directly related to service experiences
- Skills in learning from experiences
- Motivation to learn and retention of knowledge
- Insight, judgment, understanding

Social Growth and Development:

- Social responsibility, concern for the welfare of others
- Political efficacy and civic participation
- Knowledge and exploration of service-related careers
- Understanding and appreciation of, and ability to relate to different people

What Do Educators And Students Say About Service Learning?

Former Labor Secretary Riley suggests that "As a response to our national need to reconnect children, families, and school, service learning can improve learning and instill an ethic of service and citizenship in our youth." He adds that "...we can significantly improve students' education through active learning of subject matter in real-life settings." John Dewey maintained that "The mind is not individual but social, and learning is a by-product of social activities." About the natural integratedness of learning through service, a teacher in Massachusetts says, "...you don't have to say, 'I've got to do math, I've got to do English, now what am I going to do for community service learning?' It all fits together naturally..."

What Are Some Potential Problems With Using Service Learning?

As with any other non-traditional approach, there are potential problems connected with the use of service learning. These include challenges by parents to requiring service for graduation, the usual legal and logistical problems of students being off campus, location and supervision of service sites, training teachers for effective use of service learning, and building in adequate reflection into the experience.

How Can I Learn More About Service Learning?

How To Establish a High School Service Learning Program by J. T. Witmer and C. S. Anderson, ASCD, Alexandria, VA, 1994.

Enriching The Curriculum Through Service Learning by C. W. Kinsley and K McPherson (Eds.), ASCD, Alexandria, VA, 1995.

In The Service of What? by Kahne, J. And Westheimer, J. *Phi Delta Kappan*, Vol. 77, No. 9, May 1996, pgs. 593-599.

School-Based Enterprises

William Blank

A very promising practice for connecting school with the world beyond school is the "school-based enterprise" (SBE). While not entirely new, SBE's are gaining in popularity among educators--particularly at the secondary level. Perhaps the main reason school-based enterprises are so effective in bringing the real world into the school is that enterprises themselves are "real world". While serving real customers in a business enterprise, students solve real problems, deal with people, and perform authentic work.

What Are School-Based Enterprises?

A school-based enterprise is any school-sponsored activity that involves a group of students in producing goods or services for sale to or use by people other than the students involved. Such activities can provide many of the same work-preparation advantages as employer-based apprenticeships. They can also yield important academic benefits. School-based enterprises can be designed to prepare students for both college and work. In a house-building project, for example, students can acquire construction skills and also work out the mathematics of structural forces. Students in a school restaurant can make soups and sauces and also analyze their nutritional content.

What Is The Primary Rationale For Using School-Based Enterprises?

The SBE is a proven means to accomplish the two main missions of high schools: preparing students for careers and for further education. The advantages of school-based enterprises transcend preparation for specific kinds of work. These include deeper understanding of academic subject matter through application in a practical context, motivation from solving problems with immediate consequences, and generic work skills.

What Are Some Examples Of School-Based Enterprises?

Students in thousands of high schools each year perform important, productive activities that add to their academic and occupational preparation. They build or rehabilitate houses, staff child-care centers, publish books or magazines, run restaurants, raise crops or livestock, repair automobiles, operate retail outlets and provide other services as part of their school programs. In Kentucky, students at Marshall County High School run the Star Bank under the supervision of a teacher/advisor and a representative of a local bank. The bank makes loans, accepts deposits and operates like a real bank. In Jefferson County, students at Western High School operate a Kroger grocery store in a converted classroom. The store stocks everything from perishables to school supplies.

Fairfax County, Virginia operates a housing construction program in which students construct and sell houses. By the eighth house, profits were sufficient to finance the next house without a bank loan. The tenth house sold for $525,000 in 1991, enabling the foundation to develop a tract of land on which students built six homes.

Belle Fourche enrolls 350 students from a sparsely settled area of South Dakota ranches and farms. Groups of students run SBE's linked to both academic and vocational courses. SBE's at Belle Fourche include masonry, plumbing, cabinetry, carpentry, foods and agriculture. In addition, there is a writing program begun in 1982 featuring individual writers from the creative writing class that produces children's books .

What Are The Benefits Of School-Based Enterprises?

When working in an enterprise, students are engaged and involved emotionally, psychologically, intellectually and often physically. Below are some of the proven benefits of using school-based enterprises cited by Stern, el al.:

- Real world application of academic skills and concepts .
- Teaches how to ask questions

- Integrates academic and vocational education
- Learning multiple aspects of an industry
- Problem solving
- Social support for one another's learning
- Generating revenue
- Time management
- Teamwork
- Teaching other students
- Socialization
- Generic and specific work skills

What Does Research Say About School-Based Enterprises?

Stern, et al. relate that "There has not yet been any systematic evaluation of SBE's to test whether they have achieved their educational and social purposes." He adds that there is testimonial evidence from students in five regions of the U.S. who have participated in enterprises while also holding part-time jobs. Students were asked questions about their out-of-school paid jobs and about their work in enterprises. Based on questions in which there was a statistically significant difference in students' responses to questions comparing the two settings, the researchers drew the following conclusions:

> "...students think SBE's are more closely related than non-school jobs to their education. Several questions about the use of math on the job, one question about reading, and one question about writing all indicate that SBE's give students more opportunity to apply on the job what they are learning in school. Direct questions about whether the job lets them practice what they learned in school gave the same result. Evidently, these students find that their SBE experience reinforces school learning more strongly than their outside jobs do. SBE's also give students more opportunity to learn new things. Two other questions indicate that SBE's more often confront students with the necessity to think...The only thing that students learn more about in outside jobs is how to manage money--not surprising, since most work in SBE's is unpaid".

What Do Educators And Students Say About SEB'S?

A teacher at Mt. Edgecumbe High School in Alaska talks about the impact of SBE on learning academics: "...their math was used over and over again within the class, doing statistical analysis...English applied because of the different things that we had to write: the letters that had to be written, the records we had to keep, the tolerance limits and explanation of how to do our process. So we took a lot of what we were learning academically and applied it in that class in a way that made it important."

Another teacher at Mt. Edgecumbe: "We're involved in a statewide project to design a submersible robot to go to Prince William Sound and sample the bottom for what's left of the oil spill...They've written an explanation of how this vehicle is going to work...They have drawings that they've done on the computer to explain how they want it to look...This project meets some of the competencies that we have to do for the year in marine science...doing the project meets the needs of understanding how to run a business. It comes from our philosophy that students should *do* things. We want to create students who can do things, not necessarily students who have this large body of knowledge. The Trivial Pursuit type of student is not as valuable to us as someone who can actually do something like this."

What Are Some Potential Problems With Using School-Based Enterprises?

Some of the potential difficulties operating school-based enterprises include:

- Perception among some teachers that such activities are not as appropriate or as rigorous as traditional school activities,
- Logistical and organizational considerations,
- Dealing with money and legal considerations,
- Testing and grading,
- Documenting the inclusion of specific academic and/or vocational content to the satisfaction of parents and district and state staff.

How Can I Learn More About School-Based Enterprises?

School-Based Enterprise--Productive Learning In American High Schools by David Stern, James Stone, Charles Hopkins, Martin McMillon, Robert Crain, Josey-Bass, San Francisco, 1994.

Giving Students the Business, Dan Brown, *Voc Ed Journal*, September 1995, pgs. 41-43.

Apprenticeships

Teri D'Agostino

Perhaps the oldest form of education is the apprenticeship. Prehistoric people learned how to hunt animals, grow food, make weapons and protect their families by "tagging-along", watching and trying, all the while under the protective eye of the parent or other adult. Throughout history apprentices have been learning their trade by being immersed directly in the work environment. What better way could there be of connecting school with the real-world than an authentic job setting in which the concepts and skills learned in the classroom are actually applied?

What Are Apprenticeships?

An apprenticeship is an education and training process. A student spends part of the time in the classroom and the remainder of the time in the working atmosphere. One definition is a training in which the following conditions are met:

- an industry, employer, employer group, labor union, or other formal community or work-based organization joins... to provide formal instruction in which a structured work-based experience is an integral part of the instruction;
- an apprentice agrees to work for the employer for a specified period of time;
- the employer agrees to provide structured and formal training in a specified field or trade over a defined period of time; and
- the employer provides continued technical level employment after the training is successfully completed.

Apprenticeship programs may be found in area technical centers, community colleges, and high schools. At the high school level, involvement in formal, paid apprenticeship programs is often limited to the 11th and 12th grades.

What Is The Primary Rationale For Using Apprenticeships?

What better way is there to train for a career than to be involved with the actual duties one actually performs. Through apprenticeship programs students get first-hand exposure to the knowledge, skills and talents that are needed for that particular career because they have experienced it. No longer are students relying on what a teacher says will be needed to be successful. They are out in the work force seeing for themselves where they will use the knowledge and skills learned in the classroom and lab. In addition, they are performing as part of the workforce for the company with whom they are serving their apprenticeship. This provides the apprentice with a unique opportunity for future employment.

What Are Some Examples Of Apprenticeships?

True apprenticeship programs involve a partnership between labor and schools. For example, Seminole School District in Florida and Siemens Stromberg-Carlson have developed a partnership which provides an apprenticeship opportunity for students articulating from high school to Seminole Community College. Students are expected to meet high level academic standards as well as deliver quality products in the industry. Students completing the apprenticeship can look forward to exciting jobs within the Siemens Stromberg-Carlson Company. Through the apprenticeship model, students receive a meaningful, quality education and Siemens Stromberg-Carlson is assured that the workers being trained are aware of and willing to perform within the company's quality standards.

In Germany, formal apprenticeship programs are available to high school students in a wide range of occupations ranging from bank teller to automotive to culinary arts. These apprenticeships often include a substantial wage.

What Are The Benefits Of Apprenticeships?

The most obvious benefit to apprenticeships is to have a well-trained, entry-level work force. Listed below are some of the other benefits:

- Students are better able to understand the "big picture"'
- Transition from school to employment is made easier
- The private sector is provided with opportunities to take an active part in education
- Training time is shortened, which reduces employer training costs
- A school that conducts apprenticeship on-the-job training is able to extend educational opportunities that are beyond its own physical and financial resources
- A continuing pattern of school-community relationships is developed
- Provides significant, meaningful, incentives for students to do well in school - and even to stay in school.
- Opportunity for students to receive payment.
- Immediate application of academic and vocational skills and concepts learned in school.

What Does Research Say About Apprenticeships?

One state's advisory council on vocational education concluded that apprentices were better educated, more productive, learn new skills faster, were promoted more often, were less often unemployed, and earned more than workers who learned their skills in other ways. They also found that 86.2% of a group who were apprentices were either satisfied or very satisfied with their jobs as a whole.

What Are Some Potential Problems With Using Apprenticeships?

Some of the potential problems that may be faced in initiating apprenticeships include budget considerations, organizational problems, company operating procedures which may not provide for apprentice labor, school credit for on-the-job apprenticeships, selection of apprentices, and quality of instruction.

How Can I Learn More About Apprenticeships?

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Internships

Sandi Harwell

Internships have long been an important method for teaching adults. Internship, a teaching method borrowed from the medical profession, is used as part of the education for teaching careers as well as careers in administration, public service, and counseling. Using Internships to link the school setting with the world beyond school is powerful because it provides real-world experience. The use of internships in secondary education is a fairly new concept.

What Are Internships?

The value of internships as a teaching method lies in its experiential nature. Interns actually perform in the role for which they are training even though they are under supervision. Internships strongly connect the world of theory with the "real-world" of practice. Despite the varied forms of internships due to the many professional areas which use this method, they all have three basic characteristics:

- Internships are short-term and are most often non-paid
- Internships offer students an opportunity to function in professional work situations, rather than simulations
- Internships provide "on-the-job" training experiences

Internship programs also require three basic components: The academic institution, the sponsoring agency, and the intern.

What Is The Rationale For Internship Programs?

Internship programs provide the opportunity for students to apply theoretical principles from the classroom into the real-world environment. The opportunity allows students and teachers alike to determine if additional study is needed by the student and helps identify any shortcomings or weaknesses in the classroom experience. Internships can be an opportunity for growth for students and instructors alike. The integration of theory and practice can be observed in a supervised real-world setting.

What Are Some Examples Of Internships?

Probably the two most common internship programs are those for student physicians and those for student teachers. At the secondary level, internships have not been used widely. In both the medical profession and the teaching profession, internship is reserved for the end of the educational program. Internships require a self-directed learner who can work independently with a minimum amount of direct supervision. Cooperative education programs can be viewed as internships. Clinical experiences in the secondary health occupations classes may also be considered internships. If structured well, these types of secondary programs offer students the opportunity to decide whether or not the career area is of interest before investing time and money into postsecondary programs.

What Are Some Benefits Of Internships?

The major benefits associated with internships include the opportunity for students to experience, first-hand, the profession or job for which they are training. Internships provide the students with real-world experiences rather than simulations and allow problem-solving in the context within which they will perform once their educational program is completed. Another benefit is in the opportunity for employers to observe performance of students in a real-world setting before actually employing them for the position or job. The potential networking allows students the opportunity to make connections which will benefit their job-seeking after completing the educational program. Internship is also a low cost recruiting tool for businesses. In addition, the business receives the added service of the interns at little or no cost.

What Are Some Problems Associated With Internships?

Internships when used inappropriately will not provide the valuable experience they were designed to give. It is not uncommon to hear stories of interns being used to run errands and to do mindless tasks rather than the work they are being prepared to perform. Interns require a great deal of time for the organization in the beginning of the internship. They must be guided and advised as they begin the experience. Many times, companies are not prepared to provide adequate orientation to the internship experience. Occasionally, an internship program will report a lowering of staff morale during the internship experience. Regular staff may begin to resent the presence of the intern(s) and any extra attention they may receive. Open, responsive communication between the school and the employer and with the employees can greatly reduce the problems associated with internships. Clear communication about expectations prior to beginning the program is essential and clear guidelines for the interns must be communicated to all staff involved in the experience.

How Can I Learn More About Internships?

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Stanton, T., & Ali, K. (1987). The experienced hand: A student manual for making the most of internship. Cranston: Carroll Press.

Career Education:
A Key Component of Career Guidance

Sandi Harwell

The career choices that young people of today have compared to the career choices available to their parents are truly a world apart. Learning about those choices and how best to prepare for the careers that most reflect the individual aspirations of the student requires **career education**. Providing education about a wide range of careers and helping students make informed choices about potential careers is a very beneficial way of better connecting education with the real world--particularly the world of work. Defining career education and determining what role educators should play in assisting young people to take advantage of the optimal high school and post-high school opportunities available and prepare for adult roles has become a dilemma.

What Is Career Education?

Several terms have been used in referring to the system of assisting students to make career choices. **Career Development** is a term which suggests a life-long process through which an individual begins to develop an understanding of self, the world of work, and the way he or she interacts with this world. Career development is not an intervention. **Career Guidance** refers to the intervention strategy used by counselors, teachers, and parents to assist students in the process of locating information and support services and in gaining experiences to assist students to become knowledgeable about careers and educational opportunities available. **Career Counseling** is more than job counseling. It refers to the communication that takes place between counseling professionals and their clients as they work together to identify interests, strengths, self-esteem and other factors that influence the career planning process. **Career Exploration** refers to the process of researching and reviewing careers of interest to the student. **Career Planning** provides students with accurate comprehensive information about their abilities and interests and helps them explore and identify career paths. **Career Assessment Inventories** are standardized instruments designed to measure interest, aptitude, and personality strengths to assist students in career planning and exploration. **Career Education** is very much like

Career Guidance. It incorporates all of the above, but generally refers to the teaching/learning process as it is delivered in the classroom. Career Education can involve parents, community members, guidance counselors, career counselors, and employers in providing students with information and experiences that will assist the student in making choices to develop a comprehensive career plan. Career Education is a key component in helping the student "connect" school and educational experiences to the real world of adult roles.

What Is The Primary Rationale For Career Education?

According to the U.S. Department of Education, Office of Vocational and Adult Education, "If there is a key to forging the connection between school and work, it lies in providing career counseling throughout the school years." It is not enough to simply prepare students for exploring careers after high school graduation. The cost of post-secondary education is prohibitive unless it is an element of a planned program of study. Students need to have some idea of career direction in order to prepare adequately for admission to post-secondary programs and to facilitate the process of moving from high school to adult life. Career education, especially when delivered by a community rather than individual educators or counselors, can also help young people meet and develop relationships with adult role models for all major adult roles.

What Are Some Examples Of Exemplary Career Education Programs?

The National Center for Research in Vocational Education conducted a national search for exemplary career guidance and counseling programs. Career guidance and counseling programs as identified by this study, included the process of delivering career education as the student focus. The exemplary programs included three major elements identified by Maddy-Bernstein as necessary for successful career guidance programs. The three elements included developing a career guidance and counseling plan for students; collaboration, articulation, and communication with all major stakeholders; and institutional support, leadership, and program evaluation. The three elements are further broken down into major components. Embedded within the major components, career education is delivered by all major stakeholders: parents, business and community leaders, as well as teachers and administrators.

The Career and Technology Education Guidance and Counseling Program of the Garland, Texas, Independent School District is strongly supported by parents, community organizations, private industries, and school staff. Students in grades K-12 are empowered to achieve their potential and experience success through a comprehensive, integrated program. Information and assistance is provided for students so that they are able to develop the skills necessary for decision-making, problem-solving, and career and life planning.

The Pathway Program in St. Petersburg, Florida, associated with St. Petersburg Community College, makes it possible for disadvantaged and underrepresented students to enter the Nursing and Allied Health programs at the Community College. The program has a strong career guidance component that helps students increase self-esteem and self-advocacy. Students develop work and study skills, learn conflict resolution and problem-solving, and are able to make career decisions that match their interests, abilities, and aptitudes.

Springdale High School in Springdale, AR, uses a teacher advisory system to help students formulate a Career Action Plan (CAP). The Teacher Advisors are trained by the guidance counselors and meet with their advisees monthly. The program boasts strong support from business and community leaders. This support, combined with the commitment from teachers, guidance counselors, parents, and administrators, allows the students opportunities to experience a wide variety of educational and occupational opportunities and assists in the school to work or postsecondary education transition.

What Are The Benefits Of Career Education?

Students who have participated in well-planned and organized career education programs are ready for the transition from school-to-work as well as for performing successfully in other adult roles. Corporate America reports an expenditure of greater than $200 billion per year for training and retraining and more than $35 billion on remedial training for employees. These costs are reflected in the prices consumers pay for services and products produced by these companies. Effective career education programs can assist students in making choices to take challenging courses which will prepare them for effective performance in the real world thus decreasing the cost to industry for training and retraining and remediation of workers. In addition, effective career education programs have demonstrated an increase in interest and performance in all high school competencies among students who are involved in a developmental career guidance program. As students who have experienced motivating career education programs move into responsible adult roles in American society, everyone benefits.

What Are Some Potential Problems Of Career Education Programs?

The greatest criticism of career education programs is a result of the fear that students will be forced into decisions that will close opportunities to them as adults. Other criticisms are related to a belief that great expenditures must be made to have them be effective and that they require specially trained counselors. Career education, if done effectively, involves all adult stakeholders within a school. All teachers and administrators as well as parent/community volunteers are actively involved in assisting students to make informed educational and career choices. According to many studies, parents continue to have the greatest influence on students in the area of career guidance. Parents need information and support to be effective as career counselors. Career education is simply preparing students to make informed decisions about education and work, it is not intended to "track" or "train" students to function in "dead-end", low-wage jobs.

How Can I Learn More About Career Education?

Preparing Teens for the World of Work: A School-To-Work Transition Guide for Counselors, Teachers and Career Specialists, Dianne Schilling, Pat Schwallie-Giddis, and W.James Giddis, Innerchoice Publishing, 1995.

Exemplary Career Guidance Programs: Investing in the Future, Esmeralda Cunanan & Carolyn Maddy-Bernstein, Office of Student Services Brief, National Center for Research in Vocational Education, December 1995.

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Teaching All Aspects of Industry

Rich Westberry

All Aspects of Industry (AAI) is a concept which is designed to give students broad exposure to many jobs within an occupational sector and help them acquire broad transferable competencies useful in any job. It represents the inclusion of concepts and skills across all aspects of an industry rather than from a single job or occupation. The concept has evolved in response to the concerns of business, educators and students that vocational-technical education has become focused too narrowly. Students in a program focusing only on the career needs of a particular occupation often do not have the skills and competencies to make a lateral move into a related field. All Aspects of Industry is designed to introduce students to a broad exposure of careers in their chosen occupational field.

What Is All Aspects Of Industry?

According to the School to Work Opportunities Act of 1994, All Aspects of Industry is defined as, "...all aspects of the industry or industry sector a student is preparing to enter, including planning, management, finances, technical and production skills, underlying principles of technology, labor and community issues, health and safety issues, and environmental issues, related to such industry or industry sector..." (Sec 4-1). All aspects of an industry includes all the careers and jobs that are involved in the day-to-day activities of the industry. An example is the many health care careers that are part of the services offered by a hospital. These careers range from professional to technical to minimal skill jobs.

What Is The Advantage Of Teaching All Aspects Of Industry?

Today; there are major changes in the demands being made on workers. Some examples of these changes include the shifting of some manufacturing facilities to team production methods or the inclusion of a production employee into the quality assurance cycle. As a result of these changes, the skills and knowledge levels required of workers are in a state of flux. It is necessary for the worker of today to be flexible and to have a fundamental understanding of where they fit into their chosen field and how their field supports the organizational system.

The needs of employers are also changing. Volk and Peel found that employers rated interpersonal and communications skills as being more important than specific technical skills for employees being hired with a high school diploma. Teaching all Aspects of Industry provides students with the perspective to understand the system they are preparing to enter and the ability to modify their behavior to suit the changing dynamics of the workplace.

What Are Some Examples Of Teaching All Aspects Of Industry?

One example of using all aspects of industry is the skill standards proposed by many of the national skill standards organizations. One of the standards sets is Hazardous Materials Management Technology. This document contains common job descriptions and the parameters of the job, common job performance standards, and the academic and employability skills needed for this career field. The emphasis is on the field as a whole, rather than a particular job position. The student will learn about the interaction of various job levels in the field. There are other standards documents, which take this same approach to defining the necessary skills and competencies for a career field.

In the automotive industry, there are various jobs that function together to produce an automobile. Each aspect of the industry fits into the overall system. When one area creates a change, the result of that change impacts all other areas within the system. By teaching about all aspects of the industry, students learn how each subsystem works in combination with each other subsystem.

A civil drafting technician will have a better understanding of the surveyor's notes if he or she has had some experience with or knowledge of surveying. If students have some understanding of each part of the system, they will have a better understanding of the whole industry.

What Are The Benefits Of Teaching All Aspects Of Industry?

All aspects of industry benefit the student by enhancing learning. Bailey, Koppel and Waldinger report that using all aspects of industry to contextualize learning increases learning effectiveness. Their report states that "...since long-term employment with one employer is increasingly unlikely, young people will need broad skills that will prepare them for a variety of jobs..." Another benefit is that students feel they are better able to apply instruction to real issues, instead of abstract problems.

What Does Research Say About Teaching All Aspects Of Industry?

Research suggests that employers are receptive to the idea of the all aspects of industry approach, but have been slow to provide broader based training to employees. Bailey, Koppel and Waldinger, find that, in companies they studied, there are three barriers to using all aspects of industry approach. These include concerns about the inadequate labor supply, short-term production demands being met, and the resistance to changes in the traditional structure. Employers suggest that all aspects of industry is most appropriate for inclusion in a secondary school curriculum rather than in the specific vocational curriculum of a post secondary institution.

What Do Educators And Students Say About All Aspects Of Industry?

Postsecondary educators appear to have the same attitudes as the employers. While they embrace the idea of all aspects of industry, the short term production demands of their institutions make implementation difficult. The concerns they express mirror that of the employers in the particular demands of their own industry and organization.

Some of the concerns expressed include: changes in the organizational structure required by an all aspects of industry approach, the level of students entering their programs and the necessity for remediation, and the normal concerns about change in any organizational structure. Educators, like employers, do recognize the necessity of changing and making career education broader. The problems appear to be in the " nuts and bolts" of the change and at which educational level the change should be implemented.

What Are Some Potential Problems With All Aspects Of Industry?

Potential problems with the aspects of industry approach appear to be in the details. Employers and educators both feel that the approach is sound, in fact needed. Yet, while they agree with the approach, implementation appears to be a stumbling point. It appears that many institutions view the adoption of all aspects of industry as a long term, comprehensive, reorganization that can be postponed indefinitely.

How Can I Learn More About All Aspects Of Industry?

Bailey, Thomas, Koppel, Ross, Waldinger, Roger. (1995) Education for All Aspects of Industry. Centerfocus 9

Center for Occupational Research and Development (1995) National Voluntary Skills Standard: Hazardous Materials Management Technology. Waco.

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School to Work Opportunities Act of 1994 (1994) Locis Document (Http://LOC.gov)

Volk, Kenneth S. And Peel Henry A. (1994) Basic Academic and Vocational Skills required of employees with only a high school diploma. Greenville, N.C.: Eastern Carolina Consortium for Assistance and Research in Education.

Integrating Academic and Vocational Education

Rich Westberry

Academic and vocational integration is a concept, which seems to make sense to academic and vocational educators alike. The idea of tying academic skills and concepts to the real world--especially the world of work--and of reinforcing academics as a normal part of vocational teaching seems to be a common sense approach. As natural as it seems, however, many academic and vocational teachers seldom make use of this of the rich resource that each offers the other. Fully integrating academic and vocational concepts and skills within the school curriculum mirrors the reality of the real world. In the workplace, in the home and in the community, students will find themselves needing to constantly put knowledge to work for useful purposes and as they go about producing and performing, they will be called upon to use academic knowledge to perform practical skills competently. Real life is not divided neatly into "academics" on one hand and "vocational" on the other. In the adult world beyond school, academic concepts and vocational competencies merge seamlessly. It makes sense, then, to better interconnect the two within the high school curriculum.

What Is Academic And Vocational Integration?

The term "Academic and Vocational Integration" has different meanings to different people. In this discussion, it will focus on the blurring of existing lines between and the interconnecting of the academic disciplines and vocational-technical programs and courses. When well integrated, academic content becomes more job and real-life focused and vocational content becomes more academically rigorous and less focused on teaching narrow skills for a specific job. When well integrated, academic instruction becomes more applied and contextual and vocational instruction becomes more than just skills training.

An example of integration would be the use of fluid calculations as part of an agricultural mechanics class. While the use of the calculations may be a routine part of this vocational class, reinforcing their being part of mathematics and physics, makes it more integrated. Another example of integration might be an English teacher having students write technical reports as a part of an English class. Such an activity would teach or reinforce the academic skills as grammar and punctuation, and would involve a real world context through the vocational context.

Academic and vocational integration, like any major curricular approach, can be done in varying ways and to different degrees. A single teacher--either academic or vocational--can integrate instruction in their own classroom. A pair or teams of teachers can integrate more comprehensively when they work together. Entire departments and or even schools can fully integrate by totally restructuring to eliminate separate academic and vocational departments and courses.

Grubb and his colleagues have written extensively about specific integration strategies that have proven successful:

- Vocational teachers reinforcing academic skills and concepts as a routine part of teaching technical competencies.
- Academic teachers tying academic skills and concepts to the world of work.
- Academic teachers using applied, contextual learning activities.
- Vocational and academic teachers collaborating.
- Using realistic, authentic projects.
- Organizing instruction around career and other relevant themes.
- Minor and major restructuring of departments and entire schools around learning communities, career academies, or a magnet school concept.

What Is The Advantage Of Integrating Vocational And Academic Concepts?

More fully integrating academic and vocational education in classrooms and laboratories has many very important advantages over delivering them separately and then expecting students to make the connections between them on their own. Among these advantages are:

- Helps to refocus the mission and purpose of school. Integration forces both academic and vocational educators to engage in substantive dialogue and to reach a common understanding about what the real purposes of schooling are. The importance of both academics and career related outcomes must be considered during such a discussion.

- Helps reduce the abstractness of instruction. Integration helps provide practical, relevant job and life-related contexts into which students can integrate otherwise abstract and theoretical concepts and knowledge.

- More consistent with how students learn. Much recent research shows clearly that the brain prefers to deal with new information in a holistic manner. The brain is ideally suited to deal with parts and the whole simultaneously. In the traditional curriculum, we separate, compartmentalize, reduce and otherwise isolate small bits of information fed to the students a little at time. When fully integrated, instructional content takes on a broader, richer, more brain-friendly and holistic texture.

- Can reduce tracking of students. Rather than having three or four (or more) separate tracks within a high school--including, typically, honors, college prep, general, vocational, and basic, large scale integration helps reduce these tracks to a few or even one. Some schools have moved toward a single track for all students--one that integrates sound academics with meaningful, rigorous career preparation in which all students are prepared for post secondary education and for entry into a career with a future.

What Are Some Examples Of Academic And Vocational Integration?

- Vocational and academic students in the Spooner School District in Wisconsin combining to monitor water quality in area lakes. Water quality is an important issue in this community, which depends on the quality of natural resources for its economic health. This project required students to analyze water quality and report the results to the community.

- Welding students at Crossland High School in Maryland being guided in writing grammatically correct sentences and paragraphs about the planning, safety and procedural aspects of their welding fabrication projects and also making detailed mathematical calculations regarding materials and costs.

- Students at Mt. Edgecombe H. S. in Sitka, Alaska producing and marketing canned salmon overseas. Students developed the marketing plan, traveled to Pacific rim countries to negotiate import agreements and learned a foreign language such as Russian or Japanese--for a purpose.

- Agriculture and mathematics students at Hoke County High School in North Carolina joining forces to design a mist system for the school's greenhouse. They calculated the volume of water needed and the amount and size of PVC pipe needed.

- A chemistry teacher at Southwest H. S. in Texas having students work together to determine the most effective, economical and environmentally friendly fertilizer for the lawns of all 105 schools in the district.

What Are The Benefits Of Integrating Vocational And Academic Concepts?

Integration of academic and vocational education promotes learning in a manner, which reflects the challenges faced by students when they enter the world outside of school. The manner in which problems are presented, the situations they will face and the skills needed to solve those problems closely model expected behavior in the real world. Students are more secure in learning as a result of being able to see the connection between school activities and the outside world. Integration activities also will benefit those learners who do not necessarily excel in a traditional, lecture and textbook based learning environment.

The other side of the equation is that society and employers will have graduates fully prepared in the actual skills and competencies required by society. Students will have a solid understanding of the manner in which they are expected to perform, and the types of constraints they will be expected to work around. Therefore, integration is beneficial not only for learning academic skills and concepts, but in helping students to enter the world beyond school more easily.

What Does Research Say About Academic And Vocational Integration?

Bottoms and Sharpe reported results of integration efforts at over 550 high schools that have been heavily involved in academic and vocational integration efforts in the Southeast. Of five representative high schools described, the authors reported that "Five years ago, two of these schools were on the verge of closing; now they are thriving. They have raised expectations, increased academic test scores, reduced dropout rates, and improved school attendance."

The Southern Regional Education Board's *High Schools That Work* program works aggressively with a large number of high schools to promote integration. Data collected by the HSTW staff indicated that during a recent three-year period, the seven most improved high school sites reported aggregate increases in scores on the National Assessment of Education Progress test in the following areas (all of these increases were statistically significant):

- Reading: from 51.2 to 54
- Mathematics: from 286.5 to 291.7
- Science: from 257 to 273.7

What Do Educators And Students Say About Academic And Vocational Integration?

A review of the literature reveals that the idea of integration is widely embraced by both students and educators. With the trends in education oriented towards preparing students for real world activities, this approach makes a great deal of sense. Bottoms and Presson state, "Learning to know and learning to do are linked."

Students have a positive response to integration. A Spooner School district chemistry student in a water quality project says, "You learn more if you experience it, rather than just hearing about it."

Bodilly and others state, "Our research shows that rather than being solely a vocational education reform, integration can be considered by the full spectrum of school types." Integration is intended for all students. They added that, "Both our literature review and our case study analysis revealed that integration efforts on the part of sites, districts, and state potentially constitute a comprehensive reform of the American high school."

What Are Some Potential Problems With Integration?

Academic and Vocational Integration is a common sense approach to education that has important benefits, however, this approach is not without it's problems. Among them are:

- Confusion about what integration really is (and is not).
- Overcoming decades of entrenchment of academic and vocational education as separate disciplines.
- The myth that applied learning is less rigorous than traditional teaching.
- Finding the time for academic and vocational educators to plan together.
- The entire educational infrastructure is geared to separating

disciplines and students.

- Lack of high quality integrated curricular materials.
- Fear that integrated learning will hurt students when applying to college.
- Misunderstanding on the part of parents, guidance counselors and students themselves.

How Can I Learn More About Academic And Vocational Integration?

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Cooperative Learning

Janet Scaglione & William Blank

To better connect how students interact in the learning environment with how they will interact with others in real life environments, a simple strategy that has become increasingly popular is the use of Cooperative Learning. Cooperative learning strategies reinforce the nature of life's collaboration. Since people naturally rely on others at work, in the community, and in family situations to solve problems and complete projects, a similar collaborative environment needs to be reflected in the classroom.

What Is Cooperative Learning?

Johnson and Johnson suggest that cooperative Learning is "the instructional use of small groups so that students work together to maximize their own and each other's learning". In cooperative learning, the teacher establishes the structure so that heterogeneous groups of students work collaboratively toward some common learning goal or task. Unlike traditional classroom learning groups, cooperative learning groups are distinguished by a number of factors:

1. **Heterogeneous Grouping**. Each three to six person group should reflect the heterogeneous nature of the population at large. Groups might be mixed by gender, race, or achievement levels. While some short-term learning groups might be assigned randomly, proponents of this method suggest that the teacher carefully select the learning teams considering both academic goals and personal characteristics.

2. **Positive Interdependence.** Individuals in the learning groups must perceive that they are positively interdependent upon their colleagues as they work toward some learning goal. This positive interdependence might be achieved through the task (division of labor), an established group goal, interdependent roles, and/or joint rewards.

3. **Individual Accountability.** Though the group has established performance goals, individuals are also measured on their performance. Whether it is through test scores, task completion, or an assessment of collaborative effort--individuals are measured on their own performance.

4. **Social Skills.** The face-to-face interaction that is required in cooperative learning reinforces the need to identify, model and assess social skills. In addition to the lesson, project, or product that groups are involved with, students are directly taught to listen actively, resolve conflicts, set and revise agendas, keep on task, and to monitor individual and group progress.

5. **Processing**. The final stage in individual and any cooperative learning activity requires groups to reflect on and assess their group effectiveness. This structured evaluation typically allows group members to identify how well they achieved both the social and academic goals of the experience. Critical to this self/group assessment is the identification of strategies to overcome the identified obstacles or barriers during the next cooperative lesson.

What Is The Primary Rationale For Using Cooperative Learning?

A major shift in management philosophy coupled with an increased emphasis on productivity has altered the organizational structure of most workplaces. The authoritarian, bureaucratic structures of yesterday have been replaced with streamlined, flattened organizational structures that respond quicker to a rapidly changing economy. In our current service-based economy, these flatter structures rely heavily on the interrelationships of people. Quality circles, work groups, empowered workers, and performance teams all reflect an environment that embraces a more collaborative, team approach. Cooperative learning provides a much-needed alternative to the traditional competitive and individualistic structures of school.

The demands of today's workplace coupled with the social and family issues that challenge our youth (increased socioeconomic diversity, need for belonging, rising crime) reinforce the need for nurturing and collaborative environments in schools. Cooperative learning provides a structure within which diverse groups of students collaborate for some academic and social purpose.

What Are Some Examples Of Cooperative Learning?

Though any collaborative structure that includes the critical elements identified previously would be considered cooperative learning, research has been conducted on a number of specific cooperative structures that might be used in most any classroom. This brief review illustrates some of the more popular versions.

Jigsaw and Jigsaw II, like a jigsaw puzzle, require individuals to learn, then teach pieces of the content or lesson to their teammates. In Jigsaw, each member of the team reads/studies one section of the chapter or content. Members then teach teammates their piece of the lesson so that ultimately, the entire lesson is covered within the group. The team studies and is ultimately evaluated on the content. Jigsaw II provides a slight variation on this format. Given a four-person group, person number 1 would be responsible for part of the content, person number 2 would be responsible for another part, etc. The Jigsaw II format then allows for expert groups to form (number one's, number two's, number three's, etc.) with similar members from the other learning teams. These expert groups provide a collaborative format for each student to become expert on their topic/content. The experts then return to their home groups to teach all of the content areas in turn.

Student Teams Achievement Divisions is a cooperative framework that involves diverse teams with teaching, team study, testing, and team recognition. All students have an opportunity to contribute to the team score not by earning the highest score, but by improving their previous performance. This allows for low-achieving students who work hard, to contribute as much as a high-achieving student.

Team Accelerated Instruction (TAI) is similar to STAD in that four-person, mixed groups are employed to work collaboratively on different units. Teams teach each other, work on assignments, check each other's work, and prepare for tests. Tests are taken individually but scored by student monitors. Teams are rewarded weekly by the number of units or projects completed.

What Are The Benefits Of Cooperative Learning Strategies?

In addition to the numerous positive findings associated with Cooperative Learning that have been validated through research (see below) both students and teachers benefit from collaborative environments. Instead of lecturing to a tuned out, turned off class--teachers become the "guide on the side." Instead of dealing with thirty-two disengaged, disinterested individual learners, they interact with a small number of groups to reinforce social behavior and reward achievement. Students learn the importance of collaboration and conflict resolution. They experience a structure that is reinforced throughout life's experiences.

What Does Research Say About Cooperative Learning?

The extensive research on cooperative learning strongly suggests that using collaborative strategies (including the critical elements previously identified) positively impact a variety of factors. Increased achievement has been repeatedly validated as indicated by Robert Slavin who reports that of 69 studies evaluated, 72% showed increased achievement through cooperative structures. In addition, Johnson and Johnson report that a meta-analysis conducted on 122 studies indicates that "cooperative learning experiences tend to promote higher achievement than do competitive and individualistic learning experiences. . . and that the results hold for all age levels for all subject areas, and for tasks involving concept attainment, verbal problem solving, categorization, spatial problem solving retention and memory, motor performance, and guessing-judging-predicting. Students in cooperative learning groups were more likely to have friends outside their own race; more likely to overcome barriers between lower and normal achieving students; more frequently use higher-level reasoning strategies, have higher levels of achievement motivation, are more intrinsically motivated, develop more positive interpersonal relationships with each other, value more the subject area being studied, have higher self-esteem, and develop more interpersonal skills. This research covers the full range of subject areas and age levels and has been available for some time."

What Do Educators And Students Say About Cooperative Learning?

Teachers who have successfully utilized cooperative learning structures are adamant about the benefits. James Schultz of Burnt Hills, New York said, "I feel like a facilitator working with people who are discussing a book together, researching a topic together, evaluating a project together--working in the way they will work in the world outside school." "It's almost impossible to implement alone," Claudia Edwards and Judy Stout, of Lawton Oklahoma report. "There must be someone with whom to share ideas, successes, and failures. So get a friend and start slowly."

What Are Some Potential Problems With Using Cooperative Learning

Given the dynamics of group interaction, noise level, personality conflicts and time management are a few challenges that must be dealt with in cooperative structures. Absenteeism can also threaten team performance and must be dealt with, as it must be dealt with in the workplace. Testing and grading may also be a challenge when shifting from group instruction to a cooperative learning approach.

How Can I Learn More About Cooperative Learning?

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Heterogeneous Grouping

Sandi Harwell

American society embraces diversity in the multitude of cultures that represent its citizens. America has long offered a sanctuary for people from different cultures and has allowed all people the freedom to maintain their traditions while experiencing the American tradition that is a representation of all the diverse cultures, which make up this "melting pot". Schools have long fought the battle to provide schooling to all--regardless of gender, race, handicap, or any other preclusionary factor. Our inclusion policies have promoted difference as strength rather than a weakness. In spite of this apparent openness, schools have continued to segregate students based on ability, gender, age, and interest. Robert Slavin suggested that when schools organize to support "... between-class ability grouping, the heterogeneity of each class for a given subject is reduced, and in within-class ability grouping, the heterogeneity of groups within the class (e.g. reading groups) is reduced".

In the real world, individuals interact with heterogeneous groups. It is not uncommon to find a young high school graduate working side-by-side with an individual twice his or her age. It is not uncommon to find work groups that include men and women, representation from diverse cultures, and variations of ability levels, including handicaps. It is unrealistic to think that by segregating students on any characteristic, schools will be able to promote real-world behaviors.

What Are Heterogeneous Grouping?

Heterogeneous Grouping is combining students rather than sorting students into distinct groups based on characteristics such as age or ability. In heterogeneous classrooms students are not segregated according to supposed ability, achievement, interests, or any other characteristic. Segregating students' results in an impoverishment of sorts whereby students are deprived of learning from the different experiences of others. Insights and perceptions from all students contribute to the richness of the learning environment.

What Is The Primary Rationale For Using Heterogeneous Grouping?

Heterogeneous grouping of students provides one essential element for developing a collaborative classroom environment reflecting the modern workplace. When different points of view are shared, students may be stimulated to think of alternative solutions and interpretations. In heterogeneous classrooms, all students can play an important role. High-achieving students can serve as tutors while students who achieve at lower levels in traditional classrooms can broaden the perspectives for the entire classroom through practical applications of complex cognitive skills. The world is made up of different people with different points of view and who communicate at many different levels. It only makes sense to let the classroom replicate the real-world human potential.

What Are Some Examples Of Heterogeneous Grouping?

Riverview Middle School in Maryland chose heterogeneous groupings as a way to deliver meaningful, interdisciplinary curriculum. The school improvement initiative was chosen after a review of school data indicated that major problems existed in attendance, student grades, state competency test scores, and disciplinary referrals.

Joliet West High School in Joliet, IL, is a diverse community in terms of racial background and income level. Students are grouped heterogeneously according to the make-up of the community. Students participate in TEAM (Together Each Accomplishes More) Seminars which use small-group, cooperative learning methods. Discipline is handled by students trained in mediation and arbitration who counsel students who are excessively tardy or disruptive. Students of all ability levels collaborate in learning experiences, and classrooms are considered open communities. As a result of the heterogeneous experiences, grade-point averages for students have improved. In addition, attitudes, motivation, and self-esteem have demonstrated improvement.

At the 21st Century School in Chattanooga, TN, students of various age levels often work together just as they will in the workplace, in the home, and in the community. 21st Century School follows a "kindergarten through competency" approach to education. Students of all age levels, from age 5 to age 18, work together. They often group themselves by common interests or projects rather than by arbitrary age-based grade-level assignments.

What Are The Benefits Of Heterogeneous Grouping?

The benefits of grouping students in ways which represent the real-world population provides students with skills necessary to communicate with people from different backgrounds. Other benefits have also been identified. Students perform at higher levels when given the breadth of experiences from which to draw when groups include members with different points of view based on culture, age, ability, or environmental differences. Heterogeneous groupings provide a "win/win" experience for all individuals involved.

What Does The Research Say About Heterogeneous Grouping?

Vygotsky, a developmental theorist and researcher whose major works were completed during the 1920s and 1930s, demonstrated that human beings are not simply products of biology. Each individual is also a product of the human culture in which he or she functions. Children learn higher intellectual functioning through interaction with adults in their environment and other children. Forman and Cazden demonstrated that dialogue between groups of students working together on complex tasks consists of mutual regulation. Working together, students can accomplish more difficult tasks than each could accomplish individually.

After the first year of using heterogeneous groupings at Joliet West High School, data showed a slight increase in attendance, a major improvement in student grades, a slight increase in state competency test scores, a major improvement in school discipline, and a major improvement in communication between school and home. Teachers worked together to solve problems. A side benefit reported by the site was the evolvement of a shared decision-making process between the team and the principal.

What Do Educators And Students Say About Heterogeneous Grouping?

Teachers at Joliet West High School indicate that by grouping students heterogeneously, students begin to form sub-groups and take more responsibility for learning. One teacher commented on the improvement in behavior, "I find that there seem to be fewer disciplinary referrals on the freshman level." Students indicated their satisfaction with the process, "I learned not to argue and always help out and share ideas that you think of and do not start fights."

What Are Some Potential Problems With Heterogeneous Grouping?

One of the most common criticisms is from parents of high-achieving students. Typically, the concern is related to whether or not the students will have the opportunities for advancement to their highest potential. Some parents and educators argue that the high achieving students will be held back by the lower achieving students. Research data indicate that high achieving students gain much from their experiences with diverse groups. Sometimes high achieving students in one area need help in another. In addition, teachers have reported that all students have a great deal to offer and that lower achieving students bring as much to the learning environment as do their higher achieving counterparts. A challenge in mixing students across various age levels is how to deal with the firmly entrenched "grade level" approach to grouping students.

Where Can I Learn More About Heterogeneous Grouping?

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Mentoring

Sandi Harwell

In *The Odyssey,* Mentor was the wise guardian of Telemachus on his journey. Since then, mentors have been recognized as sources of great wisdom and as personal guides. Mentoring became very popular following Gail Sheehy's *Passages*. Today, there is an international association of mentors and a journal, *The International Journal of Mentoring*. The recognized aim of the mentor is to promote the development of the learner or student. Usually, mentor is assumed to be a role of nurturing and assisting the student in his or her quest for understanding. In education, mentors have come to reflect the partnership of a community or business leader with an individual student or group of students. The results of successful mentorships have included increased student motivation, diligence, and better social orientation. Matching students with mentors from the community provides an excellent bridge between school and the world beyond school.

Who Are Mentors?

A mentor can be anyone who is committed to nurturing an individual through a life event or period of time. Mentors model appropriate behaviors and beliefs for a particular life role. Prince George's County, Maryland developed a mentoring program for low socio-economic level students based on the belief that "mentoring is a strategy for teaching and coaching, for strengthening character, improving racial harmony, promoting social change, assuring total quality education for all and creating opportunities for personal empowerment". Mentoring, for this group, was an answer to a concern among educators and the community regarding the success of the at-risk students. Thomas Evans described numbers of individuals who were willing to accept one-on-one relationships with young people and make a difference in the lives they touched. In business and industry, mentors help new employees learn the informal structure of the organization. In short, anyone can be a mentor--willingness to get involved is the major requirement.

In the real world, mentors play an integral part in the development of individuals. In the most common form, parents serve as mentors to their children. In business and industry, mentors assist new employees as they learn and adjust to the corporate or work place environment. In the community service arena, mentors may assist urban youth identify with positive role models, may encourage the development of academic skills in at-risk youth, and may provide work-role experiences for young people striving to find a career path of interest.

What Is The Rationale For A Mentor Program?

The basic theory behind mentoring is social learning. Bandura, Grusec, and Menlove demonstrated that through observation of models, individuals will develop and demonstrate self-reinforcement systems. Self-reinforcement systems provide a basis for self-monitoring rather than depending on externally imposed sanctions and demands. Most of our social skills are learned by watching others behave in social environments. The basis for the criticism of violence on television is the fear that young people will begin to adopt violent behaviors if subjected to continued exposure to violent models. Mentoring provides an opportunity for adults to interact positively with students to model appropriate behaviors, ideals, and beliefs.

What Are Some Examples Of Mentorships?

The mentoring program in Prince George's County, Maryland, is an example of a mentoring program developed by educators to provide appropriate role models for at-risk students. The program began with teacher volunteers. It became apparent very early that the mentors would need staff-development, feedback, and on-going training. The group identified ten stages of the mentoring process. These stages included:

1) Attraction: establishing rapport and respect for one another.
2) Cliché' Exchanges: getting to know each other, "small talk."
3) Recounting: drawing from initial conversations, attempting to find an opening for relating.
4) Personal Disclosure: exchanging personal information; body language is less formal.

5) Bonding: sharing mutual ideas, "leveling."

6) Fear of Infringement: returning to public distance, boundaries, and insecurities; realizing the status of the mentor.

7) Revisiting Framework: stabilizing feelings; developing plans that include strategies for growth with a timeline.

8) Peak Mentoring: being a resource, attuned to tempos and rhythms; mentee learns from mentor.

9) Reciprocity: give-and-take, mutual respect and admiration; mentor learns from mentee.

10) Closure: determining goal attainment and critiquing the experience.

Other examples of mentors are included in *Mentors*, by Thomas W. Evans. Evans cites examples of educator mentors, celebrity mentors, mentors committed to reform, and MENTOR, a program in which the members of over 550 law firms in 20 states have accepted the challenge of working directly with students to establish a positive adult relationship to inspire and motivate the students to achieve at the highest possible level.

What Are Some Benefits Of Mentoring Programs?

For the Prince Georges' County site, described above, benefits of the mentoring program included improved state assessments in writing and reading, improved attendance, decreased suspensions, implementation of more cooperative learning in classrooms, better social skills among students, and increased student self-esteem. "I believe that this mission is all-encompassing--success for students, teachers, mentors, supportive staff, and parents". Other benefits that have been reported include increased high school graduation rates, increased college enrollment, and decreased community vandalism.

What Are Some Problems Associated With Mentoring Programs?

The major problem associated with mentoring programs is simply not having enough mentors to meet the demands for them. Also, individuals with unrealistic expectations who have chosen to be mentors, find themselves "burned out" very early. If mentoring is used as a part of secondary school curriculum, mentors need to participate in a training program to assist them meet the requirements of the curriculum. Mentoring, if used correctly can be a tremendous asset to any program designed to prepare students for real-world adult roles. If used without planning and preparation, mentoring can be frustrating for all individuals involved.

How Can I Learn More About Mentoring?

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Evans, T.W.(1992). Mentors: Making a difference in our public schools. Princeton, NJ: Peterson's Guides.

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Correspondence Study

Stephanie VanDeventer

What Is Correspondence Study?

Correspondence study takes many forms but generally involves situations where the student and teacher are not in direct contact for all or much of the course. Instead, students receive assignments from the teacher, study and prepare on their own, and then submit work for evaluation. Home Study and Distance Learning are also forms of Correspondence Study. Having high school students complete one or more correspondence course as a part of their high school programs would require them to assume the role of responsible, self-directed learner – just as they must be when they enter the real world.

What Is The Primary Rationale For Using Correspondence Study?

The primary consideration for correspondence study has long included physical circumstances, economic needs, and availability of instructors. Correspondence study can make it possible for students in far reaching geographic locales to take advantage of learning opportunities not otherwise available. Also, as there is often less overhead than in traditional schooling, correspondence study can be economically advantageous to both students and teachers, often cutting delivery and tuition costs by more than half. Additionally, correspondence study can make instructor expertise available to a wider student audience. Finally, and most importantly, are rationale for using correspondence study (and other forms of distinct learning) with secondary students is to facilitate their development of independent learning habits and skills.

What Are Some Examples Of Correspondence Study?

While correspondence study is sometimes thought of only as courses advertised on the back of matchbook covers, there is actually a wide range of offerings and circumstances for these types of learning opportunities. Students in remote locations often perform large parts of their study by correspondence with a teacher whom they may see only once or twice a year. In Alaska, for example, teachers may serve an extremely broad geographic population, flying in by bush plane to work with a few students at a time, leaving materials and assignments for the students to mail back.

With the recent growth of computerized electronic networks, new types of correspondence, often titled "distance learning" are emerging. In these circumstances, students may travel to a school or university to meet with a teacher once at the beginning of a course. After the initial meeting, all assignments are given, performed, submitted, and evaluated over the computer network. Students can talk to the teachers as well as to other students, libraries, experts, and help agencies through electronic mail, the Internet, and the World Wide Web. These types of courses are becoming so popular that one agency is even developing a "virtual university" where entire degrees or certificates can be earned in this manner.

At the secondary education level, distance learning can be found in the example of the University of Nebraska-Lincoln Independent Study High School (ISHS). This is a fully accredited high school employing 28 full and part-time teachers. In 1988 alone ISHS recorded 12,412 high school course registrations and has issued nearly 1,000 diplomas in the past sixteen years. The states of Alaska and North Dakota maintain complete secondary correspondence schools.

What Are The Benefits Of Correspondence Study?

- Wider availability of resources.
- Reduced overhead.
- Greater sharing of expertise.

- Wider range of course offerings (a degree of the future may include courses from Harvard, a local community college, several State universities, a Nobel prize winner, and a CEO, for example).
- Flexibility of time.
- Increased dependence on self as responsible for own learning.
- Innovative course material and presentation.
- Potential for increased access to professors/teachers.

What Does The Research Say About Correspondence Study?

When implemented well, correspondence study can be just as effective and often more effective as traditional classroom based education and can offer the additional benefits of enhanced selection of courses and access to teachers. It is important to look for proven, accredited correspondence schools and to know in advance what the institution is truly willing and capable of providing. The potential is good, but some institutions do not take advantage of the potential for creative learning and some teachers are not skilled in providing quality instruction in correspondence formats.

What Do Educators And Students Say About Correspondence Study?

"I enjoyed being in control of my own pace throughout the course," commented one student in a distance learning program. "It required a different style of delivery and thinking about how to respond to students," explained a teacher of another course. Typically, students and teachers have to develop a new mindset about learning to enjoy the greatest benefit from correspondence study. Students may develop newfound independence and control but miss some personal interaction. Teachers may experience freedom from the classroom, but have to develop new ways of effectively conveying content.

What Are Some Potential Problems With Correspondence Study?

For students who are unable to take control of their own learning experience, correspondence study may be frustrating. Additionally, many students miss the frequent "social" aspect of class structure and meetings. While this can exist to some degree electronically, the type and degree of interaction is still fundamentally changed. Electronic correspondence schools may include teleconferencing, online video and voice mail, but physical proximity is nonetheless significantly reduced.

How Can I Learn More About Correspondence Study?

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Technology-Based Learning Resources

Stephanie VanDeventer

Technology-based learning resources in education have been growing rapidly over the past fifteen years. While the use of technology in schools has not kept pace with technology used in the "real world", the potential to connect the two environments is enhanced through the use of technology at various levels. Technology is so pervasive throughout society that providing technology based learning resources during a student's educational career is essential to giving students certain life skills that will be needed in their work careers and in their other roles as adults.

What Are Technology-Based Learning Resources?

While technology-based learning resources may range from school-wide administrative uses to individual student uses of technology, in this context, they are meant to include learning resources which are directly used by students or teachers for learning. They may include familiar media such as slide, film, and overhead projectors, television, and video cameras, as well as newer technologies like computers, personal digital assistants, the Internet, the World Wide Web, and other forms of telecommunications.

Technology is not static and is completely dependent on the context of the times. Twenty years ago, typewriters were "common tech" and word processors were "cutting edge". Two years ago, individualized uses of computers were the pinnacle. Today, the trend is multimedia, the World Wide Web and the Internet. We cannot conceive the new technology trends, which will rapidly emerge.

The most current technology-based resources today would include computer-based instruction, e-mail, Internet, Intranets, World Wide Web, multimedia, and large group presentation systems such as LCD panels and smart boards.

What Is The Primary Rationale For Using Technology-Based Learning Resources?

Technology based learning resources serve two major needs: They provide students with substantial opportunities to gain experience and skills at using tools that will be common in the work environment. They also enable new forms and mediums of learning and provide learning opportunities, which would otherwise be dangerous, too expensive, or unfeasible to employ in the school environment. For example, through software simulations, students can fly the space shuttle and practice rescue missions, experience a nuclear meltdown, or engage in ecosystem research into possible reasons for the extinction of the dinosaurs. Technology can provide easy, fast, frequent and cost effective communication with students of other nations and enable collaborative projects such as multinational research into global warming and environmental clean-up efforts.

What Are Some Examples Of Technology-Based Learning Resources?

Software simulations and communication are just the tip of the iceberg in the use of technology-based learning resources. Students can use technology resources to help gather and manage information, to produce creative projects, to monitor progress and project future trends. Teachers can use technology-based resources to engage students in active, and collaborative projects, and to present information in new, innovative and interactive ways. The use of technology can enhance many other promising practices such as school-based enterprises, projects and problem-based learning, etc.

Some excellent simulation and project-based technology resources include:

- National Geographic Kids Network.
- Tom Snyder Software Simulations.
- Jasper Woodberry Science and Mathematics Videodisc Series.

Some examples of using generic software include:

- Have student's research, create, and search databases to explore relationships.
- Have students use spreadsheets to forecast trends and more quickly see conceptual elements in mathematics with graphs and charts.
- Use email to enhance communication skills and develop multicultural awareness as well as to collaborate with students in other parts of the country or the world on meaningful projects.
- Use page layout and design programs to develop newsletters and community action projects.

What Are The Benefits Of Technology-Based Learning Resources?

Technology may provide greater engagement, hopefully leading to enhanced learning. Technology seems to have a positive effect on motivation, can involve greater collaboration, build information-gathering skills, and teach needed skills for future work environments. All of these benefits are dependent on the ways in which technology based learning resources are integrated into a student's educational program. Teachers must model the uses of technology and orchestrate the learning environment to take advantage of the unique capabilities of graphics, sound, animation, interaction, communication, and information management features of computers and other technologies.

What Does Research Say About Technology-Based Learning Resources?

While the research is very mixed regarding uses of technology in the classroom, some studies have concluded that there is an affective component to using technology. In areas such as writing, students appear to write more and to feel relief from the tedium of editing and re-writing. Many studies have indicated gender effects, especially regarding uses of technology in the mathematics and sciences. Overall, many students seem to enjoy creating projects using technology as a tool, and collaborative efforts have also met with success. There is some very recent research that is examining the hypothesis that thinking patterns and perhaps neural programming are affected by new media such as television and technology. The ways in which students learn may indeed be affected by the visual and interactive formats of these new media.

What Do Educators And Students Say About Technology-Based Learning Resources?

Most educators recognize that technology based learning resources are valuable tools to enhance learning as well as to teach students skills for future use. The most difficult component of using technology for educators, however, is overcoming traditional ways of presenting instruction. Many educators have had little training in the uses of technology and much of that training is now out of date. Very few teachers have received any instruction in ways to use technology to teach or how to employ it into the learning environment. Most training interventions have focused on teaching basic skills. Teachers feel that they need to see technology uses modeled and to receive better training. In many cases the students are far ahead of the teachers in using all types of technology.

As computers, video games, and interactive television enter the homes, students are entering schools with greater technological expertise and familiarity each year. They are accustomed to using computers at home and to learning in a visual graphics-based medium, and expect polished, high tech learning resources at school. In many cases, by the time they reach high school, they have been exposed to so much digital information at home and outside of school that a classroom lacking advanced technology simply cannot keep up with their expectations. Students are not afraid to experiment and use technology and are willing to share information. Interestingly however, just like in any arena, a technology rich school culture allows for the development of various levels of experts. Different types of students are emerging as "gurus". The video game king, a potential "nerd" in other circumstances, may be the hero of the tenth grade.

What Are Some Potential Problems With Using Technology-Based Learning Resources?

The ease with which work can be edited and the lure of graphics and animation have the potential to mask actual quality. Some teachers have seen that students may spend inordinate amounts of time developing the style of a cover page while failing to develop the substance of the writing in a paper itself. Teachers should take care to allow for the development of both areas. The speed with which technology changes makes it imperative that teachers be given regular and frequent training and the time and resources in which to develop new skills. Some other potential problems, related mostly to teachers and administrators, include:

- Lack of knowledge about potential uses of technology.
- Lack of knowledge about uses of technology in the real world.
- Fear of technology.
- Technology used only as a reward system.
- Inequitable distribution of resources.
- Tendency to accept technology as absolute and infallible.
- Failure to use technology appropriately and to recognize where "human" factors and abilities are best applied.
- General uncertainty regarding social values and mores governing technology distribution and use.
- Initial cost and maintenance.
- Rapid obsolescence.

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Student as Teacher

Stephanie VanDeventer

What Is Student As Teacher?

Using the student as teacher involves the student in the active creation and facilitation of learning. Rather than acting as a non-participatory, passive receptacle of information, the student now becomes the driving force behind the entire environment and activity of learning. This may involve his or her individual learning, or may extend to the learning of other students and teachers as well. Its most general feature is the student becoming the driving force in the learning situation rather than the teacher. In the real world, students will frequently be involved in learning on their own and in teaching others. What better way to acquire those skills than by using them frequently while in school.

What Is The Primary Rationale For Using The Student As Teacher?

When students are actively engaged in the construction of learning it is believed that greater conceptual understanding and enhanced skill development can occur. Students must give greater thought to the design, presentation and construction of concepts and ideas if they are involved as active deliverers of content and information. Recent research in constructivism indicates that this may result in effects such as enhancing long and short term memory, introducing metacognitive processes, developing problem solving skills, and encouraging organization, research and logical thought processes.

Another rationale for charging the student with the responsibility of orchestrating learning for him or herself or for another student(s) is to give the student valuable experience in planning and delivering instructions and enhancing their confidence and self-esteem. After all, they will often find themselves in the role of instructor at work, in sports, at church, and in the family.

What Are Some Examples Of Using The Student As Teacher?

A common example is that of peer tutoring where more advanced students assist their peers in learning similar material. An emerging example of student as teacher involves mixed age and ability groups in which older students may work with younger students or where students with different skills help teach others. Another example of student as teacher is when students engage in meaningful self-directed or independent learning. A fairly nontraditional example of student as teacher involves the use of programming languages and authoring languages with computers. In these cases students are "tutoring" the computer, teaching it what to do and how to do it. This represents a decided shift from the view of technology held by some in which computers are the transmitters of knowledge. In this case, students simply use the media as a vehicle to develop innovative educational applications of their own design. A promising variation of student as teacher at the secondary level is when students take an the partial or full responsibility to teach a class session, special seminar or an entire class.

What Are The Benefits Of Student As Teacher?

Potential benefits may include:

- Increased feelings of empowerment over learning.
- Decreased tendency toward "learned helplessness".
- Development of planning and organizational skills.
- Development of metacognitive abilities.
- Development of collaborative skills.
- Increases in long and short-term memory.
- Development of social skills.
- Personal satisfaction through internal locus of control.

What Does Research Say About Student As Teacher?

Learning situations in which students take the lead can be an effective way to increase motivation and independence as well as interdependence. As students feel more comfortable in these situations they are more inclined to take risks and experiment with learning through questioning and solving problems. Ancillary benefits may include increased social skills and greater tolerance and acceptance of others.

What Are Some Potential Problems With Using Student As Teacher?

Some of the potential difficulties associated with using students as teachers include:

- Especially in their initial endeavors, students may require regular and frequent assistance from experienced teachers as they develop their ideas, abilities and skills.
- Some students may experience frustration at a perceived lack of direction.
- When working with other students, some natural social difficulties may initially emerge. Teachers should be alert to helping to reconcile such encounters and turn them into learning opportunities.
- Teachers will need to monitor the quality of the learning experience for both the student learners and student teachers. Not all "teachers" will be at comparable levels.

How Can I Learn More About Student As Teacher?

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Career Academies

Craig Winger & Alan Barber

The Career Academy (CA) is an educational strategy intended to better prepare students for success in both the worlds of work and postsecondary education. Career Academies are one of the school-to-work strategies specifically authorized by the School-to-Work Opportunities Act of 1994. The general intent is to make school more relevant, realistic, and engaging for students and to prepare them successfully for the world beyond school.

While there has been an extensive growth of CA's across the country in the past several years, the form has existed for over 25 years, dating back at least to 1969 in Philadelphia where such programs were aimed at dropout prevention. Today there are Career Academies in over 300 high schools around the country.

What are career academies?

Most career academies have similar characteristics. Each academy is a school-within-a-school that provides high school students with a three or four year program integrating their academic learning with the study of a particular industry and the careers of the people who work in it. Typical career fields addressed by academies include health, financial services, business, electronics, and communications, among others. An academy's career focus is usually determined by local employment opportunities and evidence of growing demand for such expertise in the marketplace.

Students in an academy are grouped together for many of their high school courses and may stay with a small group of academy teachers for several years. Academic courses use a curriculum that draws on the academy's occupational field. Instructional techniques and tools include hands-on learning, team projects, real-world problem solving with real-world consequences, integration of academic subjects with other academic subjects, flexible and block scheduling, to name only a few.

Local employers representing the academy's career focus help plan and guide the program. They serve as mentors and provide work experiences for the students. Such experience may include shadowing, practicums, summer internships, apprenticeships, and part-time employment. Teachers can also receive orientation and training related to the career field.

What is the primary rationale for creating career academies?

The academy approach is seen as a potentially powerful way to improve students' success in school and work. The approach is intended to address these long-standing problems through its three essential structural characteristics: The *school-within-a-school* feature, for example, is designed to form closer bonds, and to create a strong peer group support system. Many Students describe their career academies as being like a family.

The *integrated academic and career/occupational curriculum* addresses the problem of high school classes being so different from the real world, and students' feelings and perceptions that school has so little relevance to life after school. It is clear that students learn best when course content and instruction are based on problem solving, real-life projects and hands-on learning opportunities.

The third academy structural characteristic, *employer partnerships*, is also designed to bring the world of work closer to students' lives and school experiences. These partnerships offer students opportunities to explore career options through work experiences, mentorships, and interaction with workers in the academy's career field.

What are some examples of career academies?

Forest Hill High School, in the Palm Beach County (Florida) School District, has two academies. The first of these, The Palm Beach Academy of Engineering and Technology, began in the 1993-94 school year, and includes grades 9 through 12. The academy's setting is unique: one large, highly integrated room in which 125 students and 5 teachers interact all day long. In this one room the academy's entire curriculum is addressed, including all science, language social studies, engineering technology, and most math.

The Baltimore School system is using the Career Academy as a model to restructure and rejuvenate all of its comprehensive high schools, some of which had become low performing and had been threatened with state take-over. School officials felt a pressing need to transform their large schools into smaller learning communities primarily to give students a sense of belonging. Baltimore academies represent the typical range of career fields: business and finance, travel and tourism, maritime, criminal justice, sports studies, and transportation and engineering. There are also some unique academies in the Baltimore system including the Cab Calloway Academy for the Arts, Music and Humanities and a newly formed academy of assistive technology leading to employment in the medical prosthetics field.

What are the benefits of career academies?

Consider this list of encouraging benefits:

- Increased teacher satisfaction.
- Decreased student absenteeism and dropout rate.
- Increased student performance.
- Increased student self-esteem.
- Increased student engagement with the learning process.
- Greater student responsibility for learning.
- Greater emphases on teamwork.
- Learning environment more closely matches the requirements of a modern workplace.
- Increased employer satisfaction.

The form of the career academy is adaptable to local conditions and requirements while still maintaining the essential defining characteristics of an academy (school-within-a-school, integrated curriculum, employer partnerships). The integration of academics with vocational or career-focused instruction makes clear to students the relevance of academic knowledge, and higher student motivation to learn is the result.

The academy concept also addresses broader issues of school reform. A typical career academy transforms a portion of its host high school into a smaller, more personalized school. Teams of teachers' work together, sharing the same group of students. Students see the same students frequently for most of the day. Relationships flourish between students, between teachers and students, and between teachers. The relatively small size of an academy, the lack of typical flux in classes, the personalization, and the development of relationships contribute to an atmosphere more conducive to learning than the typical high school classroom.

Teachers are provided more influence over their work. Authority and responsibility for many decisions and resources, normally reserved by the school office or district administration, are pushed down to the teacher level.

What does research say about career academies?

Research on career academies is somewhat sparse and preliminary at best. However, early indications are very promising. For example, a second academy at Forest Hill has been started, with a career focus on Environmental Science. Its strategies are based on what has been learned from the first academy about integrated learning. On any given school day, about 20% of the Academy students arrive 30 to 45 minutes before school and ask to be allowed in to begin their class work. Daily, students have to be almost forced to leave and go to lunch. The academy had a suspension rate of 2% (3 of 125) during the first semester of operation, compared to a rate of 23% (302 of 1300) for the rest of the school. Students with 45 to 90 days of absence the prior semester, had 6 to 10 days of absence during their first semester of academy attendance

The Manpower Demonstration Research Corporation (MDRC) has undertaken an extensive, long-term evaluation of ten Academies across the United States. The first phase of the study is complete and some of MDRC's key findings are:

All ten of the participating high schools were able to implement and sustain the three essential structural elements of the academy approach. The academies vary in ways that demonstrate their adaptability to each of their high school's needs and circumstances, demonstrating that the approach can be implemented in a wide range of school settings. The academies attracted large numbers of applicants with a high degree of demographic and educational diversity. Of the students selected, 84% subsequently enrolled, and 73% of students enrolled were still participating two years later. Compared to their colleagues who do not teach academy classes, CA teachers report having more opportunities to collaborate with each other, are more likely to see their environment as a learning community, and are more likely to develop more personalized relationships with their students.

Some research indicates that motivation to learn is significantly increased in learning environments in which learners are provided with choice and control. Learner choice and control are clearly a fundamental part of a soundly operated career academy.

What do educators and students say about career academies?

Educators, when they become comfortable with CA's, often say they would not go back to regular teaching. If a truly integrated learning environment is established, teachers report that when more than one teacher is present, they spend more time with students who require individual help.

As mentioned above, teachers in academies report "having more opportunities to collaborate with each other, are more likely to see their environment as a learning community, and are more likely to develop more personalized relationships with their students."

In an evaluation of its Business Administration/Management Academy, one school reported:

- Students believe that expectation levels are higher for academy students than other students in the high school.
- Students' perception of the importance of working as a team is increased.
- Ninety-four percent of academy students would recommend the program to other students.
- The longer students were enrolled in the academy, they more they reported that teachers care about them, are there for them, take time to explain assignments, provide help in career planning, and are knowledgeable in their subject areas.

- Eighty-four percent of academy students felt that their experience in the program enhanced their ability to make better decisions about their future.

Potential problems with using career academies

Among the problems reported from the academies, the teachers' inability and/or unwillingness to shift to a team based approach, integrated subject matter curriculum, and other non-traditional approaches and tools are common. Reluctance on the part of the school, the district, and the state to provide the necessary flexibility and adaptability to the initiatives are also reported. Many times the school and district level administration will be unwilling, often unconsciously, to sustain support for the program. Research on the phenomena of organizational change indicates the frequent occurrence of some organizational members' difficulty in dealing with transition. This coupled with misperceived or misunderstood changes, particularly changes that are dramatically different or dramatically successful, can manifest as a gradual withdrawal of support or even resistance or sabotage. In this context, that could mean discontinued funding, understaffing, failure to support professional development, etc.

One difficulty is the perception, on the parts of both educators and administrators, that doing things slightly differently will be sufficient for success. Simply doing the old things a little differently, with more effort or more efficiency is not enough. The career academies that have realized major results are the academies that have done dramatically different things, and not simply by doing the traditional a little differently.

Other problems that may surface include transferability of credits and grades in middle of a year or a semester; grading and assessment incompatibility with existing system; e.g., district-issued semester exams; teacher certification issues (e.g., a math teacher or a science teacher in an academy setting is likely expected to each the whole range of grade levels of their subject matter); student involvement in workplace issues, such as liability; and student and teacher involvement in rest of school activities and co-curricula activities such as band, chorus, athletics, and courses outside academics.

How can I learn more about career academies?

Career Academies: Early Implementation Lessons from a 10-Site Evaluation by James J. Kemple & JoAnn Leah Rock, Manpower Development Research Corporation, New York, 1996. (For ordering information for this and related MDRC publications, phone (212) 532-3200)

Career Academies: Partnerships for Reconstructing American High Schools, by David Stern, Marilyn Raby, and Charles Dayton, Josey-Bass, San Francisco, 1992

Alternative Schools

Rich Westberry

The term "Alternative Schools" refers to schools whose basic philosophy falls outside the mainstream approach used in the public schools. Alternative schools have paralleled the history of education typically reflecting both the coming popular philosophy and the departing "current" beliefs of education.

Alternative schools have recently gone through a revival apparently based on dissatisfaction with the current public school system. This revival has included both parents who feel that the schools are not meeting the social needs of their children, and those who feel that the value system being espoused in the public schools conflicts with what they feel is appropriate. The feeling that schools should be more relevant to the real world is a growing belief among educators, parents and students. The disconnection of schooling to what is happening in the lives of students and to the roles they will occupy as adults has helped stimulate interest in alternative schools. More and more parents and business people see alternative schools such as charter schools, as being more responsive to the real-life based needs of learners.

What Are Alternative Schools?

Alternative schools, also sometimes called 'Free' schools, are typically schools using a philosophical base dissimilar to the public schools. The types of alternative Schools discussed here typically reflect a philosophy encouraging learning by exploration and that the student has a natural curiosity about knowledge and will gravitate towards the unknown naturally. The primary approach in these schools is to allow the student the freedom to choose what they wish to explore and to help them by providing resources, encouragement, and guidance towards that end. This process is, itself, the most important aspect. Learning to learn is typically considered to be more important than the content the learner retains. This process of exploration will allow the student to learn what is needed for success in the broader world.

The primary advantage of alternative schools is the freedom allowed the teacher and the student. Many of the types of learning that are part of school reform today such as project based learning, cooperative learning, community based experiences, and others, have been used in alternative schools for many years. The nature of the process encourages these innovative approaches. The student has the freedom and the responsibility for learning.

What Are Some Examples Of Alternative Schools?

There are many alternative schools around the world. One of the best known is Summerhill, located in England, which was founded in 1921 by A. S. Neil. This school is probably at one end of the spectrum in terms of freedom, having no rules other than those voted on by the school society. All of the students have the same voice as the staff and faculty. There are no scheduled classes, no curriculum, no formal structure. This school is fostered on the belief that every child can learn and that children deserve to be treated as equals in the selection of outcomes and methods of education. The parallel in the private sector would be the small entrepreneurial-focused company with an extremely flat organizational structure, highly participatory management and fully empowered workers.

There are a variety of schools based on this approach. The Sudbury School in Massachusetts is an example of a school community acting as a democratic body to make rules and to guide the direction of the school. This school is more structured than Summerhill, yet has the same underlying principals of faith in the innate abilities of children.

Another venerated approach to education is the Waldorf schools. These schools are based on the philosophy of Rudolph Steiner. Waldorf Schools, named for the Waldorf-Astoria Tobacco Company, are similar to Summerhill in the belief that all children have the capacity to learn. The Waldorf approach is different in the method used to uncover the particular talents of each child. The Waldorf approach is to use the natural creative talents of the learner to act as a catalyst for learning, and that each student has a creative talent that the teacher must expose by using various approaches. These teaching strategies will change with the stage in the child's developmental life.

What Are The Benefits Of Alternative Schools?

The benefit of alternative schools is best expressed in the underlying philosophy behind them: each learner, unrestricted by artificial boundaries, can develop themselves to their utmost potential in a supportive environment, free to set their own goals and to progress at a pace that they are comfortable with.

Other benefits of alternative schooling include the increased maturity of the student who takes the responsibility of their own education, students who's method of education resembles the responsibilities of the real world, the exposure to both group and individual processes and the ability to schedule time independently.

What Does Research Say About Alternative Schools?

Research on alternative schools emphasizes several key points as significant. Raywid describes smallness as being significant, "Where numbers are limited, it is possible to run schools in such ways that the presence of thousands simply renders out of the question". This attribute has several effects. If numbers are low, it increases the interpersonal relationships possible between students and teachers. Smallness also reduces the systematic levels of administration, making the management of the school more streamlined.

One of the recurring comments about alternatives is the feeling of confidence and independence inspired in students. This is supported by data in a study by Smith, Gregory and Pugh, which compared seven alternative schools and six traditional schools across the United States. The lowest scoring alternative school exceeded the highest scoring traditional school in areas of esteem, and self-actualization as measured by the Statements About Schools (SAS) instrument. This is heavily mentioned in the literature; many alternative school students mention the feeling of confidence and independence the schools gave them.

What Do Educators And Students Say About Alternative Schools?

A former Community High School student, an alternative school in Ann Arbor, reflected on his experience, "I nearly dropped out in the ninth grade. The next year I went to CHS. The atmosphere at CHS let me reopen myself to learning. I left feeling that if I wished to accomplish something, I would be able to seek out any additional knowledge and use it to reach my goal - a feeling of confidence." This is a typical response from alternative school students, which the school gives them the confidence to succeed.

Teachers also typically respond in similar ways. One phrases it this way, "You know, it's strange. If you teach where everything is decided for you, you spend all your time fighting against the restrictions. And if you and the students have freedom to decide, you spend all your time and energy trying to get something going."

What Are Some Potential Problems In Alternative Schools?

Because alternative schools have a particular philosophy as their operating base, parents who are at odds with this philosophy will be dissatisfied. This is commonly remarked upon in the literature. Some students will have adjustment problems with the relative lack of structure in the schools, usually the older the student, the more difficulty adjusting (Some of the school personnel liken this to de-programming, but we will resist the urge to draw this conclusion).

One of the most common concerns with alternative schools is funding and resources. Many of these schools are operated on a shoestring, even the publicly run alternative schools are usually resource poor. In many cases the very philosophical base which drives the school seems to lend itself towards poverty. Additionally, many of these schools are started to address an immediate problem without necessary time to establish long term or reliable funding.

Another concern with alternative schools is the chronic concern about the ability of students to integrate into the world at large or into other educational institutions. Many of these problems have been satisfactorily addressed by schools who have a proven track record, although this concern continues to arise, and is a major concern with attempts to establish newer alternatives. For example, Sudbury School reports that virtually every one of their graduates who wishes to, goes on to traditional post-secondary institutions–even though they leave Sudbury without a traditional transcript or class mark.

How Can I Learn More About Alternative Schools?

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Authentic Assessment

Cindy Hewitt-Gervais

There are at least two major purposes for conducting assessments. One primary purpose is to assess the learning of the students. Another purpose is to assess the instructional techniques and materials being used in the classroom and to guide future instruction. Assessment is a meaningful activity only if it is aligned with the goals of the curriculum and of the instruction being used in the classrooms. If educators are to increase the application of real-world content within the classroom, the assessment of the learning should be equally real-world related.

What Is Authentic Assessment?

The most valuable form of assessment reflects the students' current understanding of the learning and simulates authentic life related tasks. According to Grant Wiggins, "If tests determine what teachers actually teach and what students will study for--and they do--then the road to reform is a straight but steep one: test those capacities and habits we think are essential, and test them in context. Make them replicate, within reason, the challenges at the heart of each academic discipline. Let them be--authentic." Authentic assessment of student understanding should be aligned with curriculum and instruction, promote thinking and problem solving, and should be developmentally appropriate.

There are two perspectives on how an assessment may be judged to be authentic. First, it may be considered authentic if it is closely aligned with the activities that occur in the classroom, assuming that the instructional outcomes and learning environment are authentic. Second, it may be considered authentic if the assessment is an activity that is known to occur in areas of life other than school. In addition, authentic assessment allows the educator to measure more than discrete, specific skills. Newmann and Wehlage define authentic achievement as consistent with the following three criteria:

1. Students construct meaning and produce knowledge
2. Students use disciplined inquiry to construct meaning

3. Students aim their work toward production of discourse, products, and performances that have value or meaning beyond success in school.

What Is The Rationale For Using Authentic Assessment?

In traditional classroom settings, students are asked to memorize facts and disconnected pieces of information. Traditional assessment, then, measures only specific knowledge, which is disconnected from authentic situations. When assessment of the knowledge requires application of that information, students many times are unable to comply satisfactorily. In the "real world" knowledge must be integrated in order to be applied appropriately to solve problems.

Assessment is meaningful only when it is aligned with the curriculum, with what's being taught in the classroom. If the curriculum changes, changes must be made in the assessment. Given authentic tasks which teach content and complex thinking processes, assessment of student performance must follow an authentic assessment model. The problem-solving nature of this model prepares students to meet the demands of the ever-changing workplace which requires employees to be problem solvers in order to maintain quality and to create a more efficient workplace. In addition, students will be prepared to meet the demands of all other adult roles such as home services manager, parent, spouse, and life-long learner.

What Are Some Examples Of Authentic Assessment?

One example of authentic assessment is that of performance-based assessment, where observations are made concerning how well students have mastered certain performance or behavioral tasks. This is commonly viewed as being more closely aligned with classroom instruction than are standardized tests. Product-based assessment is the assessment of a completed project or of a portfolio kept over time. The portfolio may include reflections by the students or works in progress as well as finished products. Interview-based assessments are used to encourage students to reflect on their work and to explain verbally the value that the project had for them and perhaps for others. They can be allowed to propose and negotiate the final evaluation of their work and to give the rationale for their own evaluation.

The "Jasper" series of video environments developed by the Learning Technology Center at Vanderbilt University provides an anchored instructional approach to provide a common ground for exploration and collaboration. The videos are designed to assist students and teachers to connect interdisciplinary knowledge to solve problems encountered in real-life situations. Assessment, using a traditional approach would not be effective. Teachers of sixth-grade students in St. Cloud, Minnesota, using the Jasper series, were trained to score responses using a scoring rubric to gauge growth in students' problem-solving skills. "By being able to reliably assess our students' attempts to unravel problems presented in the anchors, we hope to prepare them for the complexities of life outside the classroom walls" (Bottge & Hasselbring).

Gateway High School in the Aurora school district, Colorado, (Schnitzer) followed a model for authentic task assessment developed by Mid-Continent Regional Education Laboratory to design an assessment to measure success in authentic tasks created for a biology class. The goal of the assessment was to allow students to demonstrate knowledge in biotechnology while utilizing a complex thinking process. The rubric they developed included four-steps which described observable characteristics by which student performance could be gauged against each of the assessment criteria. Students were not only assessed by the teachers but also by their peers.

What Are The Benefits Of Authentic Assessment?

There are several benefits of authentic assessment. Such assessment can be more easily integrated into regular classroom activities. It can also be used for formative purposes - to change instruction, materials, methods, and/or student activities before the completion of a unit or lesson. The result of both of these advantages may be a reduction in the actual time needed for formal assessment while increasing the frequency of evaluation. This may in turn increase the amount of instructional time for the teacher and the amount of time for actual learning and for practicing various skills by the student. This type of assessment better enables the educator to measure processes (e.g., problem solving), attitudes, habits, and effort. It provides information on which an educator may make frequent decisions. In the example cited in the preceding section, the St. Cloud, Minnesota teachers used the authentic assessment model as a diagnostic tool to guide future instruction as well as to assess the problem-solving growth of the students.

What Does The Research Say About Authentic Assessment?

Consistently, throughout the literature, there is overwhelming evidence that teachers "teach to the test." Testing drives the curriculum. In one study, teachers admitted shortening the time allotted to teach science and social studies so that there would be more time available to teach the tested math skills. In study after study, the data point to the overwhelming devotion of classroom instructional time to the minimum proficiencies dictated by competency tests. Researchers point out that the more the incentives are present for raising standardized test scores, the less credible the test scores become and the more classroom instruction becomes separated from real-world application.

What Do Educators And Students Say About Authentic Assessment?

Teachers have said many times that the low standardized test scores of their students do not reflect the growth of the student. In addition, in spite of high standardized test scores of students, teachers have reported an inability among the same students to apply the tested knowledge in real-life situations such as making a purchasing choice based on calculating the lowest unit price. Teachers who have worked to develop rubrics for grading projects and portfolios say that they learn more about the student and the student's ability to apply knowledge from this type of authentic assessment than they ever learned from objective tests. These teachers also indicate that this type of student assessment helps to identify successful teaching practices as well. Students report less anxiety and enhanced feelings of satisfaction and accomplishment when assessed using authentic measures.

What Are Some Potential Problems With Using Authentic Assessment?

A major drawback to using any assessment other than standardized is in establishing standards for the assessment. Rubrics should be developed in order to ensure objectivity and impartiality in evaluating students' work. The development of standards or rubrics is time-consuming and requires knowledge of measurement, of the content being assessed, and of the learning processes involved. Teachers may not have the necessary knowledge in the creation of these rubrics. Another serious obstacle to adapting authentic assessment strategies is the resistance to change on the part of educators and the "system." Our educational system has for so long been dominated by traditional, fact-based, norm-referenced testing practices, it is extremely difficult to change.

How Can I Learn More About Authentic Assessment?

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Learning Communities:
A Positive Climate for Learning

Howard Johnston

One of the most powerful strategies business and industry has employed to foster a climate for increased productivity, enhance worker morale and reduce turnover and job-related stress is the use of the "work team." This concept involves a small number of employees working together cooperatively toward their own work team objectives and, ultimately, corporate goals. This arrangement provides a more sociable, supportive, almost community-like environment in which to work. Schools, like corporations, are finding that establishing smaller communities of "workers" has many positive results.

The climate of the learning environment, just like the climate of a region, controls much of the activity within the institution. The kind of work being done, the way in which it is done, and the social interactions which surround it are shaped, in large measure by the context created in the school--the social, emotional and intellectual climate of the institution. Virtually no single feature of a school has as much effect on student learning and behavior as does climate. It determines what kinds of activity are rewarded, how people interact with one another, and what values are prized and celebrated.

Climate is neither static nor immutable. It is dynamic and can change by the introduction of new activities, values or populations. It is an elusive variable because it is made up of so many different components; however, it has been studied with considerable rigor and manipulated, successfully, in a large number of institutions. From the literature on climate, educators can identify sound principles for creating learning climates which foster success for all students, particularly in preparing students for the real world of adulthood.

What Are The Principles For Creating Learning Climates Which Foster Student Success?

By creating small communities of learners, more time is allotted for individual interaction between adults and students. "Small schools come as close to being a panacea for America's educational ills as we're likely to get.". Authentic relations emerge from small groups of teachers and students engaged in common work and sharing common standards. Even within large schools, sub-groups form simply for survival. Unfortunately, 70-80% of these student groups contains no adults, so the large majority of students function without adult mentors and the voice of adult judgment.

The reasons for creating small units, even within large school buildings, are compelling. Meier outlines seven of the most important.

- Governance. A faculty small enough to meet around a table can easily agree upon goals, an action plan and an assessment of how well the plan is working. Committees are useful for discussing global issues such as institutional mission or system wide needs. Only a small group of individuals can make things happen on a day to day basis.
- Respect. Mutual knowledge produces respect and encourages understanding. The respect that comes from knowing another person is durable and resilient. Such respect can be achieved only in a setting in which people know one another -- a small school.
- Simplicity. Small size eliminates the need for complex bureaucratic structures which demean the individual, treating each as if his or her needs are identical to everyone else's. It challenges the 'one size fits all' view of secondary education.
- Safety. Anonymity creates both the conditions for violence (anger and disconnectedness) and the opportunity for it (lack of accountability for individual actions). Small schools exhibit little violence or vandalism, and even rudeness and incivility are rare.
- Parent involvement. Big schools intimidate parents, especially those who were not themselves successful in school. When the school is small, chances are good that at least one adult will know each of the children well enough to form powerful alliances with parents.
- Accountability. Only in small schools can the adults have a clear sense of how they are doing to advance the mission of the program.

On a daily basis, they can monitor the progress of students, the behavior of colleagues and leaders, and status of the program. They don't need information systems to tell them what they can see for themselves.

- Belonging. One of the most common reasons for dropping out of school is "I didn't belong there." Small schools prevent anonymity and the sense of isolation it creates. It also helps students form lasting relationships with adult mentors.

Among the most desirable effects of the small learning community is the creation of a person-centered learning environment. In these environments, everyone, students and teachers alike, assume responsibility for creating and maintaining a high level of cooperation, task-orientation and group success. Students are engaged in the management of the learning environment and in establishing the norms and values of the work setting. In the words of Jerome Freiberg, they move from being "tourists" who pass through a place without involvement, commitment or belonging, to being "citizens" assume responsibility for the smooth and peaceful operation of their "home" environment. The following chart illustrates the differences between a teacher-centered and a person-centered classroom (Adapted from C. Rogers and H. J. Freiberg (1994) Freedom to Learn, 3rd edition, Columbus: Merrill).

The Teacher-Centered Learning Setting	***The Person-Centered Learning Setting***
Teacher is the sole leader	Leadership is shared among teachers and students
Management is a form of oversight.	Management is a form of guidance.
Teacher takes responsibility for all paperwork and organization.	Students manage operations in the classroom and school.
More students are "tourists" than "citizens."	More students are "citizens" than "tourists."
Discipline comes from the teacher.	Discipline comes mostly from learned self control.
A few students are the teacher's helpers.	All students are an integral part of helpers.

Teachers post the rules.	Teachers and students develop rules in form of a classroom constitution or work rules and expectations.
Consequences are fixed for all students.	Consequences reflect individual differences.
Rewards are mostly extrinsic.	Rewards are mostly intrinsic, deriving from the nature of the work.
Students allowed limited responsibility.	Students share in all responsibilities.
Students see only those workers who are paid by the school.	Schools partner with business and community members to enrich learning opportunities and present positive role models.

In such a climate, students take an active part in the management of their work and learning setting. They become "knowledge workers," creating an environment in which the work is purposeful, engaging and satisfying. The preparation students receive in this environment is essential to effectively prepare students for their future adult roles.

The critical factor exhibited by students who succeed is *resiliency*, that "set of attributes that provide people with the strength fortitude to confront the ...obstacles they are bound to face in life." Resilient students are usually social, optimistic, energetic, cooperative, inquisitive, attentive, helpful, punctual and on-task. Generally, these are the same characteristics often used to describe "motivated" youth as well.

Strong school climates produce and foster resiliency. An acronym coined by Sagor summarizes the feelings of those students who are most likely to succeed in school: CBUPO...Competence, Belonging, Usefulness, Potency, and Optimism. Key experiences in school promote these feelings and, subsequently, student resiliency.

- Provide them with authentic evidence of academic success. (**C**ompetence)
- Show them they are valued members of the school community. (**B**elonging)
- Reinforce feelings that they have and will make a real contribution to their community. (**U**sefulness)
- Make them feel empowered. (**P**otency)

These qualities come from planned educational experiences, which are consistent with strategies used in successfully restructured schools. The figure below shows how each practice promotes specific feelings related to resiliency.

Resiliency Building Practices.

Organizational and Instructional Practices	Trait Reinforced
Logical Consequences	Potency
Mastery Expectations	Competence
Service Learning	Usefulness
Cooperative Learning	Usefulness
Adults as Mentors/Advisors	Belonging
Authentic Assessments	Competence
Student-Led Parent Conferences	Potency
Learning-Style Appropriate Instruction	Belonging
Activities Program	Belonging
Portfolios	Competence

Students learn something every day. Often, they learn that they are powerless, inept, untrustworthy and incompetent. No one really tells them that; they just seem to "pick it up" from the climate of the school. By giving systematic attention to school climate, educators can employ this very powerful instructional intervention to promote the kind of personal qualities among students, which lead to success and achievement. One of the most powerful ways of fostering a positive climate throughout a school is to establish small, intimate learning communities made up of learners, teachers and people from the community.

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Continuous Quality Improvement

John Marshall

Quality is a word that gets thrown around a great deal these days. Quality in schools is discussed by teachers, administrators, parents, students, business and industry, and community members. The question of whether or not schools are currently producing a quality product or service is asked repeatedly with responses targeting test scores as a measure of quality. Most school critics suggest that because of poor test scores, high drop-out rates, and apparent apathy of high school students, a restructuring or redesigning of school is necessary in order to produce a quality product. Redesigning schools into effective learning organizations of quality requires the development and management of a comprehensive work redesign effort. It requires planning and the application of principles used in Continuous Quality Improvement (CQI) - just as the corporate sector discovered as it struggled to reinvent itself to respond to global competition and technological change in the past twenty years.

What Is Continuous Quality Improvement?

CQI (also known as Total Quality Management) had its beginnings with William Edwards Deming. Deming believed that workers could monitor the quality of the components of products that each was responsible for. If each individual created a quality component, the end result would be a quality product. The Deming Cycle allows the worker to continually monitor the quality of the product. The first stage in the Cycle is to create a production plan. The next stage is to implement the plan on a small scale with the third stage being the determination of how well the plan has been implemented. Modifications of the plan are implemented with the cycle being repeated until total quality has been achieved satisfactorily by all involved. Schools choosing to use the Continuous Quality Improvement approach to redesigning have progressed rapidly.

What Is The Primary Rationale For Continuous Quality Improvement?

Deming believed that schools could create an environment in which all principal parties, students, teachers, and administrators, could work together in Continuous Quality Teams to make continuous improvements in the work they do together--the work of learning. Glasser supports the Deming philosophy by describing Schools of Quality as non-coercive environments in which the teachers, students, and administrators are empowered to make changes in what they do to achieve the sense of quality in their worlds. Glasser suggests that the human being strives to maintain a quality environment. When schools allow all key players to strive to experience quality, all key players will find satisfaction and continue to do the kind of work that will provide that quality experience. Glasser, as well as Deming, suggested that if schools want to experience quality, they must be redesigned into effective learning organizations.

How Can Continuous Quality Improvement Be Used In Redesigning Schools?

Experts in CQI suggest that there are seven phases that comprise an effective Continuous Quality Improvement plan. These phases if applied properly will produce real change in an organization focusing on quality. The seven principles include:

- Developing stakeholder commitment.
- Planning the change.
- Redesigning the pilot work area.
- Preparing supervisors for their changing roles.
- Training the teams.
- Aligning support systems.
- Expansion.

Developing stakeholder commitment: Creating a program that effectively meets the needs of the customer requires the commitment from a large group of individuals. Many distaricts began their restructuring efforts by bringing together teams of individuals representing the whole community. Generally, the faculty, department chairs, counselors, principal, superintendent, employers, and curriculum specialists make up the initial team.

Planning the change: Most large organizations are, for the most part, anti-change. A very important part of implementing the change process in redesigning schools has been the use of the following formula:

$$\frac{\text{Change} = \text{UN} \times \text{V} \times \text{CR} \times \text{TPL}}{\text{R}}$$

UN = Understand--People need to **Understand** the **Need** for change

V = Vision--A clear **Vision** must be created

CR = **Current Reality**--The organization must be aware of where they are.

TPL= **Transition Plan**--A sound work plan must be created.

R = Resistance--The amount of **Resistance**.

A school redesign initiative must have the ingredients on top of the equation. The more “R”, the smaller the degree of change that will occur.

Redesigning pilot work areas: A framework of empowerment must be created at the school level if the initiative is going to work. Included in the process is the analysis of all the existing work flow; applying work redesign and empowerment principles; and clarifying new approaches to the business of teaching.

Preparing supervisors for their changing roles: Advancing a quality program in redesigning schools requires principals and superintendents to be prepared to change their role to make strides to redesign the school and the classroom by integrating their academic and vocational teachers as well as the curriculum. It is this component that creates the real world connection. Comprehensive staff development for all administrators is at the core of the change process. Administrators must change the way they think and act about education. It can't be business as usual.

Training the teams: Training the education team and all parties in key areas such as customer satisfaction, developing a clear vision, roles, and guidelines, teaming skills, empowerment plans, continuous improvement, problem-solving, and goal-setting provide the appropriate base for all individuals involved.

Aligning support systems: A system of exploring best practices (benchmarking) should be installed such that a new vision can be implemented. Additionally, new redesign experiments to develop the new systems must be developed and given the opportunity to be tried in the classroom. School board policy modifications have also proven to help make the vision a reality.

Expansion: The target of the change is to eventually include the entire population of the organization. The redesign must be promoted at the local level, expanded to new areas, and celebrated by all participants. Effective redesign initiatives have spent a lot of time developing a comprehensive public awareness program complete with numerous accolades and reward systems to "toot their own horn."

The goals and objectives for redesigning schools to make them more real world and those of Continuous Quality Improvement can be one and the same. What is required is participation of all stakeholders, including administrators, a cultural change on the part of the employees, the right vision, a structured approach, good customer orientation, a continuous improvement model, and an active employee involvement.

What Do Educators Say About Continuous Quality Improvement?

In 1992, the Education Focus Group of Quality New Jersey selected the City of Burlington Public Schools to participate in a pilot program using Continuous Quality Improvement. Each local Quality Improvement Leadership team made a two-year commitment to the program. The teams selected problems to address that were a great concern to the districts. Using storyboards, the teams developed quality stories using a seven step process:

Step 1--identify the reason for improvement

Step 2--describe the current situation

Step 3--analyze the data

Step 4--formulate countermeasures/potential solutions

Step 5--review results

Step 6--standardize the methods proven successful

Step 7--evaluate effectiveness, reflect on lessons learned, and identify further areas for improvement.

The City of Burlington Public Schools selected absenteeism and tardiness as the first area of concern. The Leadership teams felt that the step-by-step process allowed them to identify the significant aspects of the problem and address those specific areas. They felt that the process helped them analyze problems more effectively before deciding on concrete actions. The principles of Total Quality Management that guided their process were:

- Those closest to any improvement opportunity should be involved in its solution.
- Learning and leadership are everyone's responsibility.
- Decisions must be made with facts.
- Understanding systems theory is central to quality.
- Continuous improvement is the norm for all activities and not the exception.

Throughout the U.S., many schools involved with reform and renewal initiatives have chosen to make the investment of time and effort to develop quality initiatives. Those districts that have done so are well ahead of their more reluctant counterparts. Identifying and analyzing the problems to be addressed and following a systematic approach for solving the problems appears to facilitate the process of school reform.

What Are Some Potential Problems With CQI?

Using CQI involves a commitment from all the stakeholders. The time involved in developing the teams and in teaching members to use the principles of quality improvement can be a deterrent. Many times, groups feel that the time element is too costly and too consuming. The benefits of the quality improvement process will pay off if the district or school is willing to make the up-front investment.

How Can I Learn More About Continuous Quality Improvement?

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High School Could Look Like This

William Blank

This monograph has described a number of practices that are very promising for better connecting the high school experience with the realities of the world beyond high school. What would a high school look like if it incorporated many of these practices? This brief snapshot of the fictional high school, Northgate High, reveals what such a high school might look like. It also gives us a glimpse of the process policy-makers might have gone through in conceiving such a high school.

Jess and Sandra smiled at each other and held hands as they walked down the hall on their way to lunch. They looked not unlike the countless other couples before them who have dated during high school. However, this is where the similarity between Jess and Sandra and most of the high school students who have gone before them ends. Sandra Smith and Jess Montgomery attend a new kind of high school. Northgate High School was recently built in Springfield as a brand new high school to serve the ethnically and economically diverse population of this rapidly growing community.

Nobody can recall exactly how it happened. Some say it started with a controversial book on high school reform. It's central theme was that the mission and purpose of high school should be to prepare all students--not just the best and the brightest--for success in the world beyond high school. Rumor has it that after being passed around for some time, this book found its way into the hands of a district school board member who became quite intrigued with the possibilities. She, in turn, shared it with three fellow board members who had a reputation for being forward thinkers who, in turn, brought it to the attention of a group of teachers. These teachers, who always had a gnawing feeling that their high school was just not working very well for most students, began to get together periodically to talk about some of the ideas suggested in the book (and some of their own ideas). It really began to take off when they shared copies of the book with parents and representatives from the business community and with the local press.

To make a long story short, four years later, this small embryo of innovative thinking had snowballed into a groundswell so powerful that it resulted in the Springfield School Board unanimously approving a plan to open the newly planned Northgate high school as an experimental "real world high school". What was so unusual about this was that they decided to begin with a completely clean slate with no preconditions, no givens, no predetermined requirements, tracks or courses. They were successful in securing virtually unlimited waivers from the State Department of Education and (even more difficult) from the local district office for a 10 year period--sufficient time, everyone agreed, to determine whether this completely new approach to high school was any better than the traditional model.

Since Jess is in his final year of high school, he spends very little time actually on the school site. He spends a major portion of every day as a water quality technician with the regional water board. He makes two dollars an hour above minimum wage and is getting a chance to see first-hand whether this might be a promising career field for him. He meets monthly with his Advisor Team made up of a teacher with whom he has worked over the previous two years, his job supervisor and a school career counselor. This week, though, Jess is spending fewer hours on his job and more hours completing his senior project and finishing his last service learning commitment at a nursing home. He is also in the last stages of completing a correspondence course on World History; all students at Northgate must complete two correspondence courses before they graduate. Jess is also preparing for his final instructional assignment which is to teach a 60 hour class on using Power Point to a group of 25 students and teachers who signed up for the class earlier.

Jess is excited about his major senior project. He was pleased that his "Ad Team" (as students call it) signed off on the project when he proposed it earlier in the fall. He is trying to determine the specific source of traces of mercury that have recently been detected in a tributary of the Glades River that runs near the school. Jess hopes to not only determine its source, but to also measure its strength, and estimate the current and likely future damage to aquatic life in the tributary. The aspect of the project that Jess is most anxious about is the need to collect and preserve samples and data in a manner that can be used as evidence in an anticipated trial in which the guilty party will face criminal charges. Jess is really looking forward to putting the extensive communication skills he has learned at Northgate into practice when testifying at the trial. He feels confident about presenting the results of his senior project to his jury in the spring, which will be composed of one of his parents, his advisor, another teacher and a senior technician from a local environmental testing firm.

He has completed many projects during his four years of high school--some as a part of a team and others on his own. Each year, he completed a major project and at the end of the year presented it for jury review.

Another unique aspect in establishing Northgate High school was the school board's conscious decision to avoid latching onto any existing program, system, or curriculum. They would build their new school from scratch component by component. Even more surprising was their decision to adopt a single guiding principle in the design of their new school rather than basing the design on the latest fad in standards or flowery mission statements. Every component of the school including the building, the faculty and staff, the curriculum, governance--**everything**--would have to meet this simple test: **Is it compatible with how students effectively and humanely learn the things that will be important to them as productive, self-sufficient, well adjusted adults in the real world and compatible with what we know about what makes teaching and learning successful and rewarding?** They were also careful to build the new school at a cost that was just slightly above the average for building comparably sized high schools in the state and for zoning the school so that the student body clearly was representative of the state and local demographics. They wanted very much to show everyone that virtually any high school could be made to work--if education was approached differently.

In addition to the overall guiding principle mentioned previously, the school board generated several statements describing important characteristics of the new school that might aid in the design of the school and its curriculum. Northgate High School:

- Defines student success not in terms of test performance, grades earned or college placement but, rather, in terms of how well the school contributes to students becoming competent, compassionate and contributing members of adult society in all its various roles such as parent, consumer, worker, spouse, etc. The school looks well beyond the latest fad or reform movement for its purpose and mission.

- Focuses not on "learning" but on "doing". Throughout their high school years students are presented with rich opportunities to become competent in life's processes and skills--solving problems, working with others, providing goods and services, getting things done, and completing projects. Deep understandings (not the shallow learning we fool ourselves with in today's educational system) will naturally result from "doing".

- Uses a curriculum which draws from real life as the primary basis for student outcomes, learning experiences and instructional materials--**not** textbooks, state curriculum frameworks or college admission requirements. The curriculum is based entirely on authentic, real life projects, problems, questions, events and student interests.

- Incorporates a variety of school based and community based "enterprises" through which the general public can purchase from students a variety of goods or services (e.g., health screenings, child care, word processing services, genealogy research assistance, etc.).

- Uses the "Student Work Team" as the basic unit of student organization. These heterogeneous, cooperative, teams are made up of a small number of students of mixed age and ability levels. Students on these teams work together collaboratively and rely on one another through positive interdependence.

- Treats students with a high degree of dignity and respect and has high expectations for all students; learners will have a great deal of freedom to determine what they learn and how and when they learn it.

- Artificial, extrinsic, stressful and non-productive means of coercing students (such as testing and grading) to engage in activities of little interest or relevance to them are eliminated. The rich, authentic, challenging learning environment and relevant outcomes will provide their own incentives and rewards for learning.

- Teachers will run the school. Teachers who are the closest to the students will be empowered to select their principal and future coworkers, establish the curriculum, manage the budget and operate the school.

- Frees the school the teachers and students from the tyranny of testing. A very minimal number of standardized tests will be given. Students, teachers and parents will look beyond the current shortsighted focus on students regurgitating trivial facts on standardized tests. Students will leave the school with abundant, rich, clear evidence of what they can do--not a test score indicating what they have memorized.

- The structure of the school and curriculum will be patterned after how organizations beyond school are organized and operated. There will be no separate disciplines, no arbitrary class periods and no bells.

Sandra is not really thrilled that Jess spends so much time this year away from school. What makes it more tolerable for her is knowing how much Jess really enjoys it and knowing how much he is benefiting from it. She is in her second year of high school and this semester is part of a five member Student Work Team. She met Jess last year when they were on the same second semester team. One thing Sandra enjoys about the way teams are organized at Northgate is the mixing of students of various age levels--usually including first, second, third and fourth year students on a single team. Sandra's current team has adopted the name "Fab Five" and has even come up with a catchy logo that is proudly displayed on their work center door. They have their five-station work center decorated attractively with posters and a few plants. Their laptop computer has their unmistakable logo on its carrying case. The Fab Five have an unofficial bet with the "Lean Machine" student work team just across the hall to see which work team can finish and present their current project first.

The Fab Five have tackled a project that has turned out to be more than they bargained for. It involves reviving a dormant program in the community in which abandoned pets from the local humane shelter are matched with inmates at the nearby juvenile justice facility. That was the easy part. What they are wrestling with right now is developing the video tape and group interaction strategies they will use to orient the inmates to the program and show them how to care for their pets. The student work group across the hall has the edge on completing their project first because theirs is a school-based project and doesn't require as much travel off campus. They are developing a spread sheet that the school cafeteria staff can use to more efficiently order food so that food waste and electricity for cooking are minimized. They have the formulae imbedded in the spreadsheet debugged but they're having trouble writing documentation that the cafeteria staff can easily use.

The Fab Five still has a shot at finishing first because the luck of the draw has their competition not only involved in their major project right *now but also has them assigned to staff the school's Financial Resource Center part of the morning on Tuesdays and Thursdays. The Financial Resource Center is one of several "school-based enterprises" that operate as profit making businesses within the school and is staffed entirely by students. The general public can visit the Financial Resource Center and, for a nominal fee, get a wealth of information and technical advice on investing, borrowing, saving, or starting a business. The Lean Machine team is scheduled (along with another five person team) to staff the Financial Center from 8 AM until 10 AM on these two days so they can't really get started on their project until after 10.*

Jess is in his last year of high school while Sandra has an additional two years before she graduates. Jess's current plans have him completing high school probably in April or May when his individual major senior project will be "juried" and he wraps up his last service learning requirement. He will immediately enter the technical institute in Springfield where he will complete the 30 or so competencies he will still need to qualify to take the state board examination for Water Management Technician. In high school, he will have successfully mastered 18 competencies that are the "core" for this and several related career programs. He has already been awarded a Certificate of Employment Competency that is now becoming more and more recognized by employers as a credential certifying that the holder has demonstrated mastery of important generic employability competencies. These include skills such as leading a work team, manipulating data using a spreadsheet and managing resources.

After completing his studies at the technical institute in about a year, Jess has plans to work full-time as a Water Management Technician and soon begin working toward his Associate Degree in Water Management Technology at the community college. Based on his high school and technical institute competencies, he can complete the requirements for an AS Degree in an additional year-and-a-half while being employed full-time as a technician at an excellent salary.

Sandra's plans are a little different. Last year, her first year of high school, (called Year 1) focused primarily on assisting her in gaining a deep understanding of her own strengths, weaknesses, abilities and aspirations by completing a series of interest and aptitude inventories and acquiring broad knowledge about and direct exposure to a wide range of occupations. During one of her job shadowing experiences, Sandra became intrigued with the idea of becoming a building contractor and specializing in building environmentally friendly structures. That first year *also helped her focus on acquiring readiness skills such as time management and learning how to learn in an independent environment (for example, how to access information).*

During that first year, Sandra was assigned a student mentor who was a third year student and a community mentor who was a business person in the community, both of whom helped her tremendously throughout the year. She will keep her community mentor throughout her high school years. Also during this first year, Sandra's portfolio was begun which contains samples of projects, reports, and other products she produces that document her mastery of a variety of skills and abilities. Sandra's dad thinks it is going to be neat to view the CD-ROM based portfolio she will leave high school with. It will contain several of the most significant products she has developed and will include over 30 minutes of video footage of Sandra presenting each of her four year-end projects to juries, interacting with some of her work teams and a formal 10 minute presentation by Sandra outlining her educational and career plans. Toward the end of her first year, her Success Plan was developed jointly by Sandra, her parents, and her Advisor Team. It mapped out an individualized educational plan to lead her to attainment of her educational and career goals. Her Success Plan has been revised twice this year to reflect changes in her plans.

Sandra has done her best to convince her five person work team to select elective projects this semester that might help her learn important academic skills and concepts and the things that will help her run her future business. She has given some thought already to how she will convince her Ad Team for her major senior project to be developing and presenting to a local bank a comprehensive business plan for starting a contracting business which specializes in environmental friendly remodeling and retrofitting of homes and businesses. She plans to continue her summer jobs as a carpenter's, plumber's and electrician's helper at local residential construction sites to gain valuable experience in as many of the building trades as possible.

A look into the future finds Jess and Sandra parting ways but both being well prepared for the important roles they will play as productive adults. Unlike their parents, whose fondest memories of high school have absolutely nothing to do with learning, Jess and Sandra reflect back on their high school experience very fondly. They both found the high expectations, rigorous requirements, authentic approaches to learning and, most importantly, the relevant, meaningful learning outcomes all served them well. They benefited greatly from having to actually teach *other students, locate their own learning resources, make their own organizational decisions and having to constantly work interdependently with others of all ages, ethnic backgrounds and ability levels. It is not surprising that their current employers have a keen interest in Northgate High School and actively recruit its graduates.*

Our school board members have all moved on to other pursuits; the district has its third superintendent since the inception of Northgate and many of the original faculty have retired, moved or transferred to other schools. Springfield itself has changed and grown. One thing has been very interesting indeed. So far there have been three serious attempts to "convert" Northgate from a real world high school model to a more traditional high school focusing on "real academics". One attempt was by a powerful school board member (who by the way, was a former university professor). Another attempt was by a group at the state level who were convinced that Northgate was getting too much attention and was creating too much turmoil in the state by constantly stirring up discontent with the traditional high school model. The most recent attempt was by a small group of vocal parents who felt their "gifted" students were being held back by having to spend so much time on work teams with students of lesser ability. All attempts at "reform" were thoroughly defeated by outspoken former students, employers and members of the community who have seen first- hand how marvelous a school can be in successfully preparing all its graduates for their future.

Could There Be A Northgate High School In Your Community's Future?

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